REMOTE IMAGING GROUP

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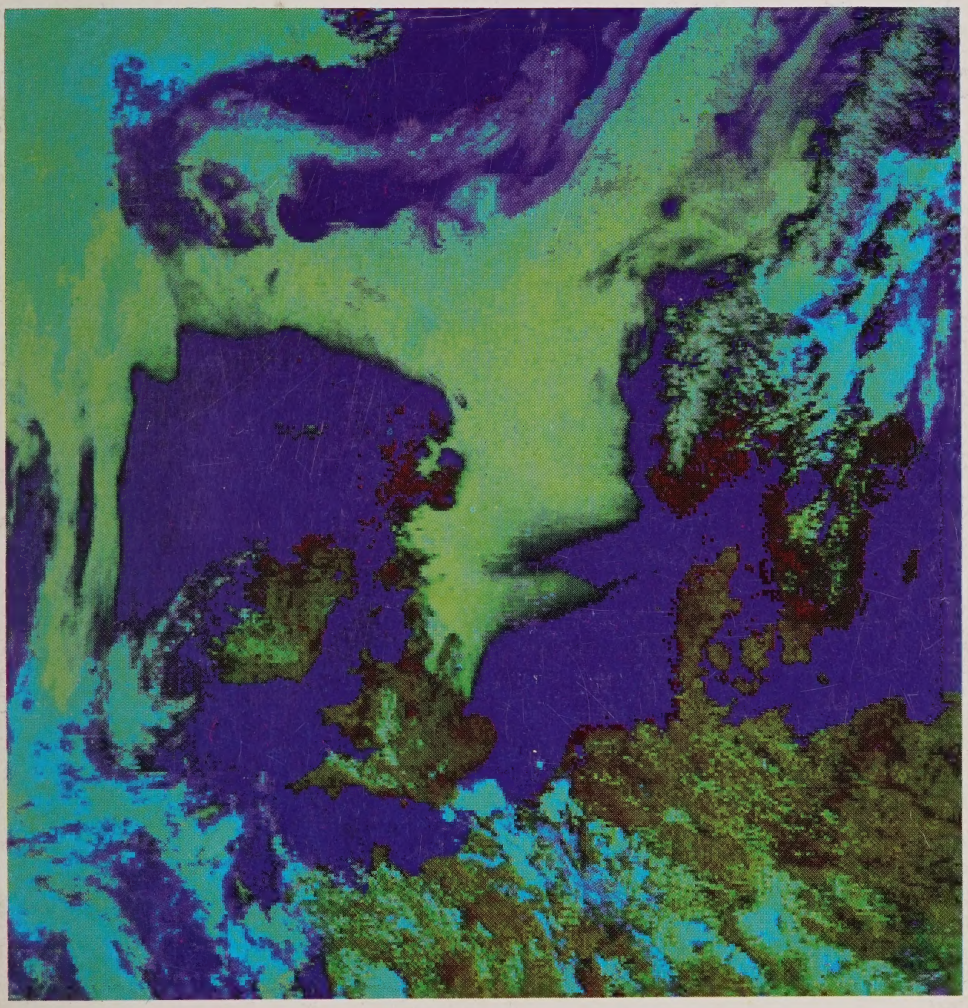
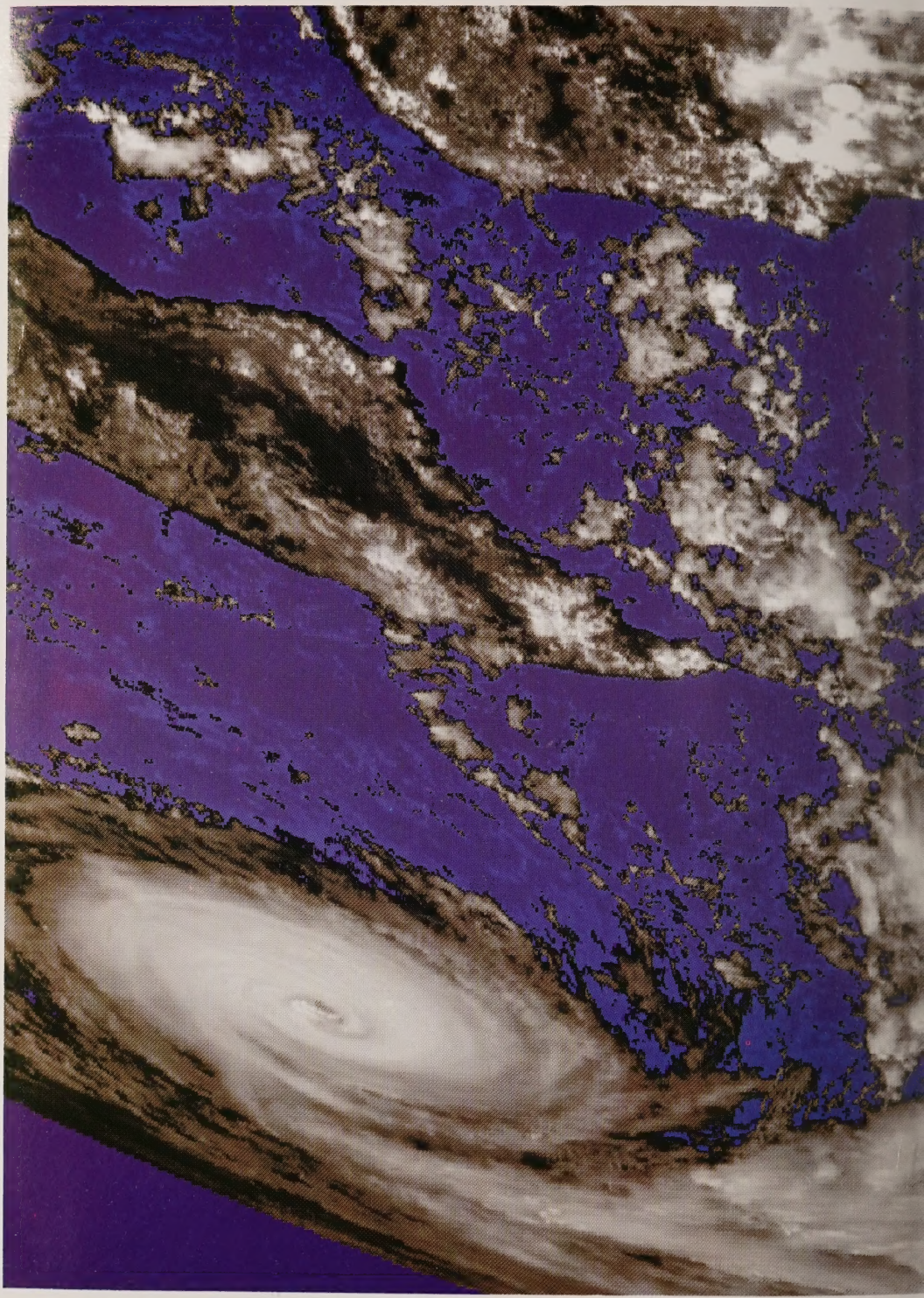


JOURNAL NO.33 JUNE 1993



REMOTE IMAGING GROUP JOURNAL No.33

JUNE 1993

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Centre Pages: Large Vis AIVH-format image of Middle East by Marciano Righini, MET4, digital HR, taken on 1 March 1993, 13.02 UTC.
Cleaning up a noisy GIF file with Neopaint by Mike Goodall, see article on page 27.
Meteosat image by Peter Wakelin, see article on page 31.

REMOTE IMAGING GROUP.....OFFICERS 1993

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Published by *The Remote Imaging Group (RIG)*
Printed By *AbbeyPrint, Spalding.*

CHAIRMAN'S WAFFLE

HENRY NEALE

It has taken a fair bit of determination to actually sit down and type the Waffle in this time! Work on the farm, RIG work, and my many other commitments seem to be taking more and more of my time. I haven't been as quick at despatching goods recently, and then there was the AGM, followed by two days at Picketts Lock. Well, Henry was just about knackered for several days!

To those of you that have had to wait for goods, I am sorry, but like you, spare time is extremely limited, and there is never as plentiful a supply as we would wish. Anyway, I'm nearly caught up, and by the time you read this a lot of other things will have happened.

The RIG Conference is uppermost in my mind at present, and what I should include in my presentation. Afterwards, it will of course be, well you didn't mention w, x, y, and z. Its always easy to be wise after the event! If this one is a success, and no doubt it will be, we can look forward to more events in the future. We are grateful to Dave for organising our first conference and hope that the heights that we had aimed for are achieved, and that there are bigger and better ones for the future. I must add that there are limits to how much work any one of us can do for RIG, yet we still try to do the impossible! We are not able to include a report on the conference this time but no doubt it will be a continuing subject in subsequent Journals.

The Electronic Bulletin Board has been upgraded to Remote Access and all reports are that it is working well. There are still a few callers who do not seem to be able to access it correctly. There are several features available now that are a lot easier, especially for me to drive as the operator. I will give you a quick guide to its innards. It accepts 300/1200/2400/4800/9600 bauds, but certain manufacturers modems do have peculiar dialects that this machine sometimes doesn't recognise. If you log on for the first time it searches to see if it recognises your name; if it doesn't, you them have to go through the initiation rites! No you don't have to roll up your right trousers leg, show your left nipple, and repeat "RIG is the Greatest" - but you can if you want to! It might cause concern to the immediate family, especially if someone walks in at the same time! It will ask you several questions about what your modem/pc requires and eventually what password you would like. It takes

about 2 minutes, or half the time if you are a good typist! You can then look around the database, but you cannot download anything until the sysop upgrades your security level. I normally look at the machine twice a day, but that is not guaranteed.

When your security level has been raised you can then download anything from the "Tracking, Graphics, or Main" areas. This means that you are looking at that type of software, and not a complete load of disassociated garbage. The files seemed to fall into those types of brackets, and in my mind, logical. The Tracking area has tracking programs, kepler editors and the keplers themselves. The main area has those that I couldn't find a definite home for, but might in the future.

At log-on, a brief news rundown goes by, and at the end is Peter Wakelin's Satellite report. I am tagging on the next Kepler update date there to indicate when I expect to renew the Keps. If its several days away then they have just been done, but if its tomorrow they might be a week old. You'll soon get the hang of it. If you have any software that might interest us, you may upload it and I can then put it on display. You might have a later version than we have, so other members will benefit as well.

The HST courier does seem to have its peculiarities, but we seem to have tamed most of them. We now have the Ymodem and Zmodem protocols available as well as the original Xmodem and their different variations. Its all a matter of sorting out the initialisation strings - and don't tell me it's easy! - especially when I've just found out that in default conditions it had been reverting back to its factory settings.

Since 10th March, i.e. 6 weeks, 107 people have been initiated and it has had 610 calls. We are having the usual problems with noisy lines. That results in Hieroglyphics appearing on the screen, even when you are not doing anything! It is not the local line to the exchange but bad lines between exchanges. In these primitive areas they rub bits of metal together to do the switching! Drop the line and try again. Enough said for now, but no doubt it will resurface again next time.

I have experimented with the dish feed to see what the probe length should be. I used a 1 metre dish and a 50 ohm 10 db pad immediately after the feed to obtain maximum power transfer. This pad had been measured previously to check its accuracy. It had seen better days but was only 2 or 3% out and certainly adequate for the purpose. I used the Dartcom feed because it was easier to adjust. Both it, and the Timestep feed, are identical size-wise but

Timestep's has a fixed length probe whereas Dartcom's is adjustable. I tried using a plastic trimming tools to adjust the screw but it affected the readings. I then tried using a glass rod. I had to carefully grind a blade on the end with a green grit wheel. I tried this but it also affected the readings so I had to revert back to manual adjustment. With the length too long, and slowly shortening it, the signal slowly peaked at 32mm but then dropped at a much faster rate. If it was a little bit long it made very little difference but if the opposite it made a large difference in signal level. The end result was that the probe peaked at 32mm; even less than the Timestep probe. The Dartcom adjusting screw was too long and the threads bottomed so I had to use a shorter one.

What was the end result? I used snoise on the signal after I had done these tests and there was hardly any difference. I seem to have come to a s/n floor which is difficult to better. I managed 38.8 db, just over 1%, which wasn't too bad.

I checked it against the much travelled Quad Loop Yagi with 2 rings missing, and to my disgust there was just about an identical signal to noise ratio, even though the S-meter was only showing about 2/3 of the signal! Was there some internal noise upsetting the reading? I tried a Proscan Rx to see if it was any better; but no difference! I still think that as you approach 1% s/n there are other things to take into consideration - its just that Henry doesn't know what they are!

Those of you saving your pennies up for either of the Timestep PDUS or HRPT systems (rx and data card) had better keep saving. Last year the rx and data card were available on special offer for £499. I have been sent a recent price list and now find them priced at £1198! It took my breath away to say the least. I quickly recovered when I read the Quorum advert in the latest edition of Weather Sat Ink. The complete system including dish, feed, preamps, rx, bit conditioner, etc. and including the rotators, was £10,000. Even a 1700 Mhz weatherproof downconvertor (comparable with the Dartcom downconverter) was £400! I think I will go back to farming!

So - after I had recovered, I can only comment that the best offers are in the RIG Journal!

Well, I had better end it there, and get some more goodies wrapped up ready for the post in the morning, so that you can get your itchy fingers on them!

Best Wishes, Henry.

FROM THE EDITOR'S DESK

JAMES BROWN

One of the characteristics of homo-sapiens seems to be the capacity for expressions of initial amazement at the latest innovation, followed remarkably quickly by the onset of the blasé 'so what?' phase. Last year you bought a product which had the adrenaline pumping as you got it up and running. This year you can see all the extra things you'd wished it had, and it sits there as it has done for the last 'n' weeks and performs identically, but now you've come to rather take it for granted.

Manufacturers constantly see their products follow this well-documented 'S' curve. Initial take up is slow, then if the product is good, the sales graph shoots upwards, gradually reaching a peak after a year or so, only to fall slowly away as the product becomes 'old hat'. What was once deemed totally awe-inspiring and amazing, becomes common-place and ordinary. State-of-the-art becomes yesterday's technology, and it seems to happen at an ever increasing pace.

In one sense this phenomena has a great benefit for Remote Imagers, as scientists are no different from us in being motivated by this inclination. The fuzzy images of the first satellite picture dumps no doubt gave some contractor and designer a great thrill, but they have moved on a great deal in their aspirations and the resulting progress has opened up new areas of interest to the amateur. More imagery, greater global coverage, increased data, wider choice, better quality etc. So while the venerable METEOSAT 3 chugs away at 75 degrees west, the labs are filled with specifications for satellites to be launched in the year 2000. We live in a world of ancient and modern, and so we do our best to reflect that theme in this journal.

Once again our pages are filled with a heady cocktail of Do-It-Yourself Primary Data, concoctions of computerised graphics manipulators, confessions of a remote imaging addict, and an hors d'oeuvres to tempt anyone and everyone to innovate and update.

Perhaps it is worth making the comment that as a group, and in particular by our journal, it would be good to think that we can try to build bridges not only between the different users of remote imaging equipment, and their manufacturers, but even between the scientific community itself and the

ordinary person, whose taxes often fund so much of that research and development. As a group we hope to foster personal links with the wider satellite imaging fraternity, for mutual befit.

As the popularity of RIG increases, so do the contributors, and it becomes increasingly hard to accommodate every submission in a given quarter. The 'in-tray' is already well lined for RIG 34, and perhaps a word of guidance to would-be authors is in order. The editor does not have the ability to foresee what the postman will bring in the last few weeks. Hence if material comes in early, and it is worthy of publication, then in it goes! If we reach the 90 or so page limit of the magazine in this way, then however desirable an article may be, if it arrives after that point, it will have to be held over until the following issue. If authors fear an element of irrelevancy may creep in due to the passage of time, small updates or corrections can always be submitted nearer the dead-line - but not too near!

Finally, members who submit small-ads are reminded of the need to keep a record of their advertisement and adhere to the asking price. We have had a complaint of an advertised price being changed subsequent to publication, and this may well have been accidental, but we need to ensure accuracy in this area.

As the Summer months approach may we borrow the famous split-infinitive of a certain star-ship's crew as our motto, and let all Remote Imagers 'boldly go where no-one has gone before' - up the ladder to fix the aerial on the chimney-stack!

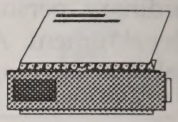
Live long and prosper,
James.

P.S. An error crept into the last issue in the Glossary for Beginners section "PDUS" stands for Primary Data User Station (not Service).

FOR SALE...

ICS FAX-1 Weather Fax Demodulator, with dot-matrix printer and cables for connection to HF receiver. £125.00
Brian Measures, G0HKR, 23 Green Leys, Church Crookham, Fleet, Hants. GU13 0PN
Tel: 0252 624358

FROM THE MAKE-UP EDITOR'S KEYBOARD *MIKE GOODALL*



Well, the March journal was printed and despatched early and all members should have received their copies by the third week of February. We seem to have the deadlines licked now! With RIG32 out of the way all had gone quiet here, and I was waiting for the first rush of requests for copies of the GIF Library disks. As the NOAA images were poor; very little contrast on the IR, and virtually nothing to see on the visual due to the low altitude of the Sun, I wondered if the Russian Mets had anything to offer. Met3-3 had gone off; sad, because it had been producing some fine IR images. Met3-4 was still operating in the daytime, so TrackII was loaded and the relevant times noted.

This satellite had been in an unusual mode in March. The IR sensor had been switched off, giving a black picture with the narrow sync bars. When it got within the sunlit portion of the Earth the Visual sensor switched on, with the wide sync bars and greyscale. The contrast and resolution was good, especially in the Arctic regions, so several passes were taken; Greenland, Iceland and Scandinavia were all seen clearly. Then on 18th February something unusual occurred. The last Westerly pass visible from the UK gave a pleasing, but unexpected image. On the left of the screen appeared the Hudson Bay, followed by the Labrador Coast and the Gulf of St.Lawrence, cloud free!

But the special surprise was the small circle inland, only previously seen on images sent to us from the States and Canada. Yes, it was the Manicougan Reservoir. In all its glory, cloud free and with a good contrast. I had never realised that it could be seen from East Anglia. Further research with the Tracking program revealed that it is probably visible every few days or so, when the satellite tracks midway between the Labrador coast and Greenland. The reason it was never noticed in the past was probably due to not having taken the specific pass, or the fact that cloud had covered the area, which is quite normal. Needless to say the picture has been cleaned up and saved in my archives. I wonder how many others have seen this area with a good clean signal. The other direction, towards the East was tried over the next few days, and it was revealed that it was possible to receive images as far as the Urals and just beyond, around 62 degrees East! The River Ural shows up well with good contrast, but with the River Volga, most of it appears to blend in with the landscape. I was amazed to see how much detail was available from this Russian Satellite, especially in that badly lit season.

I have recently updated the old PC286 Computer to a PC486/sx 25MHz model. It won't get the Journal out any quicker, but will probably save some time in producing it. I have also updated my Video card to a Prisma 1280i, which produces 24-bit colour on the PC. I believe these are now available to members from Timestep at under £100.00 including VAT and P&P.

The final improvement we have been able to make, to render the Journal more professional, is to change the typeface we use for the text. Several members have commented on the old sanserif one and asked if it was possible to improve on it. This had also been on my own mind for some time. We have now purchased the "Palatino" typeface for Wordperfect, and it is used in this issue for the first time. I hope you like it and find it easier on the eye than the old one. It is the typeface used on probably over 80% of paperbacks these days, because of it's readability and pleasant appearance.

Help! Does anyone out there use a Casella Recording Thermo-Hydrograph. After two years the small plastic pens on mine are coming to the end of their useful life, despite being regularly refilled. Can anyone supply a spare pair?

Please note: Due to my Holiday commitments the copy deadline for the September issue has had to be brought forward by ten days.

The future deadlines are now as follows...

Cover date of Issue	*Deadline for Copy*
SEPTEMBER 1993	15TH JULY 1993 (Revised date)
DECEMBER 1993	25TH OCTOBER 1993
MARCH 1994	25TH JANUARY 1994
JUNE 1994	25TH APRIL 1994

Advertisers copy will be required 7 days earlier than the deadline date, and should be sent direct to Mark Clarke. Late ads will not be included.
These dates will be rigidly adhered to and there will be **NO** exceptions.

Also, remember that Members Private Advertisements are *FREE!* If you have any RIG-related equipment for sale, send in the details to James.

PLEASE REMEMBER... SEND ALL COPY FOR ARTICLES, READER'S LETTERS, ETC. DIRECT TO JAMES BROWN.

I only deal with the RIG GIF Library on a direct basis. ***I can only accept calls about the GIF Library from 2 till 4 in the afternoon.*** *For all enquiries regarding GIF viewing programs and suitability for your specific computer, contact the appropriate member listed on the Helpline page.*

REPORT OF THE 1993 AGM
John Tellick

Minutes for the RIG AGM held on March 6th 1993 at Sandown Park.

The meeting commenced at 16:20 with 16 members plus the Committee present. An apology for absence was received from Peter Wakelin.

Minutes of the 1992 AGM.
These were agreed by the meeting and signed by the Chairman.

Chairman's report.
Henry reported that 1992/3 had been a very hectic year for RIG, with a doubling of turnover, and that we were beginning to creak at the seams. It was not his intention to double turnover again in '93! So don't expect to see a turnover of £200,000 for '93. The workload on some officers was becoming too great. Henry talked about the RIG EBB which had been disconnected for some time and was being updated to provide a better service to members. If members wanted several files off the EBB, Henry suggested sending him a disk and £1, and he would copy the files, to save on the phone bill. Henry said that members had gone mad over the Christmas and New Year period following the publication of RIG 31. The orders never stopped coming in for goods, and manufacturers could not keep up with the orders.

Treasurers report.
Mark handed out copies of the 1992 Statement of Accounts and went through them, confirming the doubling of turnover in '92. Mark stated our 'member only' sales policy; thereby saving us tax on our profits. This is strictly enforced; notices are displayed on the stand at all rallies, and members are checked on the data base when placing orders. The group was in a very healthy financial position which enables RIG to bulk purchase at discount, and pass this saving on to members. A member from the floor wished to know where our account was held, and was the balance gaining interest. Mark said the account was with Barclays in Halstead and most of the balance was in a premium account, with a small working balance in a current account; transfers made as and when required. Mark explained the introduction of Visa facilities. This was done mainly for the benefit of overseas members who in the past have had problems; as had the treasurer, with bank drafts and Eurocheques.

Henry pointed out that whilst 'plastic' had been used by UK members it was introduced for the convenience of overseas members and not as a regular service for UK members. The 3% surcharge was not RIG profit, but bank

charges RIG has to pay, and is therefore passed on. Mark also talked about his other job as Advertising Manager and the fact that RIG has placed advertisements in Short Wave Magazine, Practical Wireless, Radcom, Amateur Radio Action (Australia), and also in US, German, French and Dutch magazines. Mark said RIG is already the largest weather satellite group in the World. A member from the floor wondered about personal advertising, sweatshirts, etc. This had been considered by the Committee, but owing to the cost, and extra work involved, was not taken up.

Secretary's report.
John said that he'd spent a considerable time since August in contact with the WMO, EUMETSAT, NOAA, the Met Office and the DTI with regard to registration of receiving stations, the WARC '92 'give away' of a large part of the 137MHz weather satellite band, and increasing pager interference. He stated the situation to date, and the great difficulty he'd had getting information. A full report will appear in RIG later. Registration was not required by the DTI for UK weather satellite receiving stations, but the DTI would protect the 137MHz band from 'other' services. This has not been the case since Mercury paging now operate transmitters quite legally at 137.975MHz. Enquiries for information, help, articles, schedules, etc., had increased during the year, but a request to schools for feedback, and news of their activities, disappointingly resulted in no replies. Perhaps with the help of Tom Walter (letter in RIG 32) something might be achieved on the education front.

Henry mentioned at last years AGM, that local members meetings might be arranged during the year; this, apart from one organised in the Worthing area, sadly appears not have taken off. Henry also pointed out that several schools had now purchased hardware from RIG and were pleased that help was at hand if needed.

Membership Secretary's report.
Ray showed a chart comparing the membership position to date with the situation at last years AGM. This year all sections; paid up members, new members, and overseas members totals are up. As of the 6th March 1993 we have 1035 paid up members, 49 new members and 154 overseas members. It looked as though we might reach 1500 members this year, especially with Mark's advertising campaign. The figures show to date that 370 '92 members have not renewed. Reminders will be sent out in a couple of months, as last year, when half the outstanding members did renew. Ray said the new subs. form triggered a lot of comment; in fact around 400 made comments, mostly complimentary, but with a few brickbats thrown in, and quite a few heartfelt

requests for beginners articles and construction articles. Henry thanked Ray, as, due to speedy renewals by most members, Ray had been very busy.

Newsletter Editor.
James said that for our group the Journal is a real focal point, and many folk have spoken appreciatively of it, and how they really look forward to it arriving. James posed the question... "What has 324 pages, 37 major articles, 22 different authors, and 21 pictures, some in colour"? Answer, RIG 29-32, and that did not include all the regulars. Had one purchased a book with all that information it would surely have cost at least £20. RIG members get it for £9. James said last year had seen many changes and upgrades to the Journal; most due to the work of Mike Goodall; we now have a professional product. It was impossible to calculate how many man hours went into putting it all together. James said he tried editorially to adopt a middle of the road approach. The only problem being that at times one is likely to be knocked down by cars from both directions. He suggested that as far as content goes, you cannot please all of the people all of the time, but hopes that we please some of the people some of the time. RIG is very dependant on members contributions and James was very grateful for all articles received; but for some of those who write in, please remember that we are an amateur group run by unpaid volunteers, and not the highly paid staff of PC World, etc. We do our best.

Make-up Editor.
Mike thanked James for the work he did, making his make-up job so much easier. Thinking about hours spent on RIG Mike had calculated, including the GIF library, that it must amount to around 1000 hours per year. The GIF library was going very well, over 200 requests for disks, and now Les Hamilton has converted the GIF files into Archimedes format, and these are now available to Archimedes users. Owing to a bad bout of flu Mike felt that it was time he quit before his voice gave out.

John had a word of praise for the Journal team from the METEOSAT Operational Programme Manager who had written to congratulate the group on producing such a professional publication. Henry suggested that with increasing Journal costs it may well be necessary to increase subscriptions next year, this will be decided by the Committee.

Rally Secretary.
Dave said that most rallies went well last year, except Leicester, which is proving a problem for this year; but we will try to be there. Dave will be representing RIG at the US Dayton rally - the largest in the World, hoping to sign up many new members. The RIG weekend proposed at last years AGM

was a reality with 80 deposits received so far, and more coming in. This was much better than had been anticipated and was a remarkable achievement. Lectures have been added for the Friday evening, and Saturday was going to be very busy. The competition for the lowest noise home built LNA was still awaiting entries but there was still plenty of time. Henry chipped in that there were kits available on the stand downstairs. Dave said that the RIG Conference was going to be "a great and important event." The Chairman said that was the end of the reports, and suggested that the floor showed its appreciation for the Committee's work, which they did.

Nominations for the 1993 Committee.
John had received no new nominations for the Committee to date. Henry then asked, since the present Committee were prepared to serve again, if the floor would re-elect them 'en bloc'. This was accepted. The present Committee were proposed for re-election by Trevor David. Seconded by Jim Chetcuti.

Any Other Business
Henry asked the floor if there were any points members wanted to raise. One member asked for articles on the MAC computer. Henry pointed out that we had very few Mac owners, but suggested he contact Dartcom, and also another of our suppliers (sitting not far away) who was also developing a Mac system "providing you have a large enough cheque book." It was again pointed out that we were limited to the articles written by members and sent in. Another member said that there were few articles for the Amiga. James answered by saying that sadly few articles for the Amiga are received, and that none are turned down; and he was speaking as the ex-Amiga column writer of a few years back. The Committee had considered an Amiga column in the journal, but the material was just not there. Henry asked that if members had any information, news of developments, upgrades etc. for goodness sake let us know, preferably on disk for inclusion in the Journal. Henry asked for any more comments - there were none.

James then said he'd been waiting to see if anyone would thank Henry, as he takes the lions share of work when it comes to RIG, so much so that he pictured Henry's farm as having only one working field now. James asked for a show of appreciation which was given.

Henry thanked the floor and thanked those who stayed for the AGM, though the numbers were rather disappointing. He also asked that when members write to the Committee, to please include a phone number, as a quick call can often save a lot of time. Henry then thanked the Committee for their support. The meeting ended at 17:20.

FROM THE TREASURER
Mark Clarke

Report on Accounts - Our 1992 financial year ended on 31st December and has again seen a dramatic increase in our sales - up 117 % on 1991. As can be seen from the printed Statement of Accounts, the group has once again prospered, resulting in a moderate surplus and a healthy financial position. Tight monitoring of the expenses has enabled us to maintain the subscription rate even though we have had to absorb recent VAT changes in Europe. 1994 is likely to see changes though - you have been warned!. The introduction of payments by Credit Cards too has met with a positive response particularly from our overseas members for whom it was intended. Since taking office in 1990 when Rig had a turnover of £19,000 who could have predicted the growth in the group to it's present level coupled with the amount of work it now involves!.

RIG NOW ON PACKET RADIO.

Yes, for all those members who are Radio Amateurs and into Packet Radio, I am now editing a general bulletin for distribution to the UK (GBR). Watch your local BBS for the following message:
WXSAT @ GBR G3CQL RIG WXSAT BULLETIN (Date)
The first message went out on 4th April and I propose to update this approx every two weeks as and when new information is received. Each bulletin will contain the following information: Polar Satellites Status, Geostationary Satellites Status, Latest news in the Wxsat scene, RIG at Rallies and a message on behalf of the group for non-members. At this stage I do not propose to publish Keplers as these already appear on Packet from a variety of sources. Would those members in the UK who propose reading the bulletin drop me a message, from time to time, at my local BBS GB7NNA, just saying "I am reading your bulletin, keep it up!!" This will keep my enthusiasm running to continue the service.

EUROPE and REST OF THE WORLD - HELP WANTED

To distribute the bulletin to Europe and the Rest of the World I would like to set up hub stations; these will be quicker than just sending a message to "WWW". If any amateur in any of these regions would be prepared to help by acting as a RIG Bulletin distribution point would they kindly leave me a message expressing interest to G3CQL @ GB7NNA and I will be pleased to send them details. Members with any particular enquiries regarding RIG matters or WXSATS in general may also leave me a message at my BBS.

73 Mark G3CQL @ GB7NNA.

REMOTE IMAGING GROUP

Balance Sheet as at 31 December 1992

ASSETS EMPLOYED	Balance 1/1/92	Addns	Depn	Balance 31/12/92
FIXED ASSETS				
Equipment	3279	1053	1444	2888
CURRENT ASSETS				
Stock			8549	
Debtors			1879	
Cash at Bank			14746	
Cash in Hand			1799	
			26973	
CURRENT LIABILITIES				
Creditors			782	
Corporation Tax			126	
			908	
NET CURRENT ASSETS				26065
				£28953
FINANCED BY				
CAPITAL ACCOUNT				
Balance 1 January 1992				19062
Surplus for the Year				9891
				£28953

REPORT of the AUDITORS to the MEMBERS of REMOTE IMAGING GROUP

We have audited the accounts on pages 1 and 2 in accordance with approved accounting standards, and we have carried out such procedures as we consider necessary.

In our opinion, the accounts, which have been prepared under the Historical Cost Convention, give a true and fair view of the state of the Club's affairs at 31 December 1992 and of the result for the year ended on that date.

47A High Street
Halstead
Essex
CO9 2JD

Maurice Lake & Co
Accountants and
Taxation Consultants

19 February 1993

(1)

REMOTE IMAGING GROUP

Income and Expenditure Account for the Year Ended 31 December 1992

Sales			75763
Subscriptions			14964
Advertising			2077
Donations			49
			92853
Less:	Opening Stock	7800	
	Purchases	65608	
	Closing Stock	(8549)	64859
			27994
Add:	Bank Interest Received - Gross		506
			28500
Less:	Management Charge	1250	
	Newsletter Printing	6396	
	Telephone	1196	
	Postage and Stationery	6347	
	Travelling Expenses	65	
	Rally Expenses	553	
	Software Licence	200	
	Insurance	231	
	Subscription	15	
	Bank Charges	310	
	Accountancy	250	
	General Expenses	226	
	Corporation Tax	126	17165
			11335
Less:	Depreciation of Fixed Assets		1444
Surplus for the Year			£9891

JVFAX v5.1 AND PC INTERFACE

Eberhard Backeshoff, DK8JV

JVFAX.EXE is a multi-purpose program for the reception of both weather chart and photo style fax. For radio amateurs, there is an additional transmit-option and a simple implementation of a SSTV receiving facility.

Fax reception can be performed fully automated, supporting time schedules. If your computer is equipped with a VGA/SVGA graphics card you can create a weather movie automatically when receiving geostàtionary satellites.

Depending on the interface an intensity resolution up to 256 grey shades can be obtained. Spatial resolution depends on the index of co-operation selected and can be up to 1900 dots per line.

In conjunction with an adequate interface a so called Automatic Tuning Control (ATC) can be enabled when receiving FM-FAX, which greatly facilitates the tuning process. This ATC also compensates for receive frequency drift within wide ranges.

The program can be configured for a wide range of ports and interfaces.

JVFAX runs on any IBM PC or 100% true compatible, and under DOS3.0 or higher. It supports all current graphic cards e.g. CGA, EGA, Hercules, VGA up to SVGA in 256 colours. Drivers for some 8/9 or 24 pin printers are also included, as well as a driver for the HP-Laserjet.

Pictures can be viewed, stored or printed during reception. Stored pictured can be viewed, zoomed, printed or retransmitted. Zoom magnification and width/height ratio can be freely chosen. Zoomed portions of a picture can also be stored as independent pictures.

For the storage of the pictures the commonly used GIF file format is used. There are a lot of conversion programs to transfer this format to others, e.g. TIFF and PCX. An export routine to TIFF is directly implemented. If the program is run in SVGA 256 colour mode, weather pictures can be viewed in false colours.

The following IOCs and drum speeds (LPMs) are available for FAX reception: IOC (between 255 and 576); LPMs (48, 60, 90, 120, 180*, 240*) LPMs marked with a * can be run on slow computers with reduced resolution only.

APT operation is fully supported, including automatic recognition of IOC in weather chart transmissions. The APT mode can be replaced with an so called "Squelch mode" e.g. for the reception of low-orbiting satellites.

Automatic phasing of pictures is possible with normal as well as inverted phasing sequences.

For the coverage of the different types of FAX transmissions (weather charts, weather pictures and press pictures) up to 10 modes can be defined within the program. These modes will store defaults for IOC, LPM, APT tones, and number of grey shades etc.

When displaying pictures on the screen the full screen format is used in order to achieve the maximum possible resolution. Internally, however, the program will generally use a much higher resolution that is by default:m resolution (in dots per line) := IOC * Pi.

As a result of this, you can take zooms out of a stored picture that will show details not normally recognisable on the screen. Alternatively you can set the resolution for each mode individually.

Interface hardware requirements

To operate the program you need some kind of interface. The purpose of such an interface is to convert the analogue audio signal that is provided by your receiver in a digital form that is readable from your computer.

JVFAX uses data input from either a serial (e.g. COM1:) or a parallel port. Port addresses can be freely chosen from within the program. When running the program on a serial port however, the serial input line of this port is not used; but instead the four handshake lines DCD, RI, DSR and CTS are utilised as a kind of 4 bit parallel port. This helps to reduce hardware expense on the interface side.

I developed several interface circuits to operate together with this program. Schematics for a 256 grey-level AM/FM demodulator can be found on the disk: (AM_FM1.GIF to AM_FM6.GIF) which can be printed out well on a laser printer. They are also reproduced on the following pages.

In the meantime a lot of interfaces or interface kits have become available. The kits and interfaces currently available in Germany are listed at the end of the documentation.

As an alternative, you can have the computer do all the work, and let it decode the audio signal; for that you must amplify the audio to a RS232 compatible level using a simple comparator circuit. This will only work if the comparator is connected to a serial port that is configured to use IRQ4 or IRQ3, and if the PC is fast enough.

When using this method, some memory-management programs such as EMM386 may interfere with this "simplest" solution and may have to be disabled for the program to run with acceptable results. But, even when results are obtained, they will always be worse than these obtained with a "more sophisticated" type of interface.

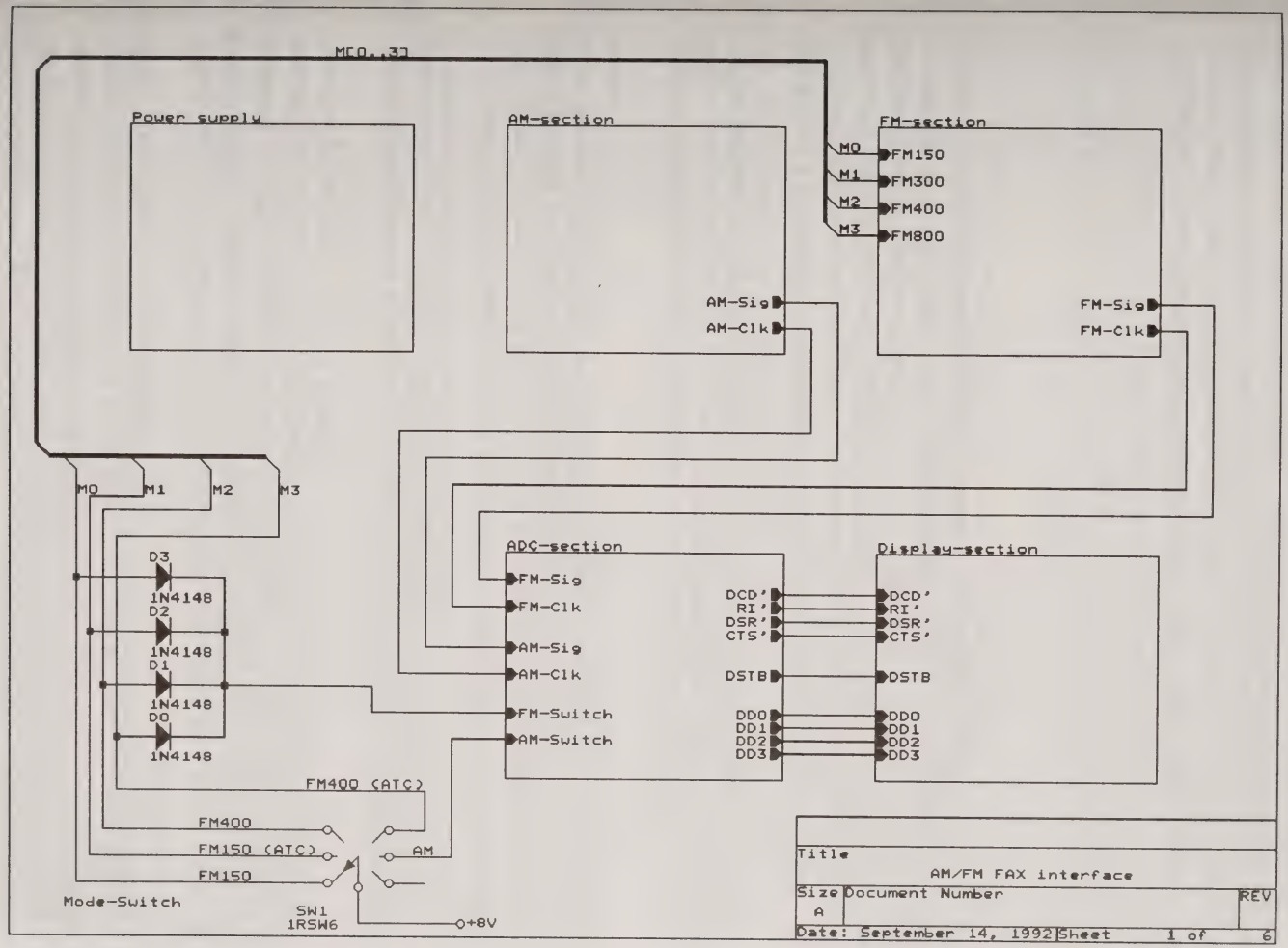
A circuit diagram for a simple comparator amplifier is shown in the DOC file. It consists of one IC (741), one 47KΩ resistor and one 100nF capacitor.

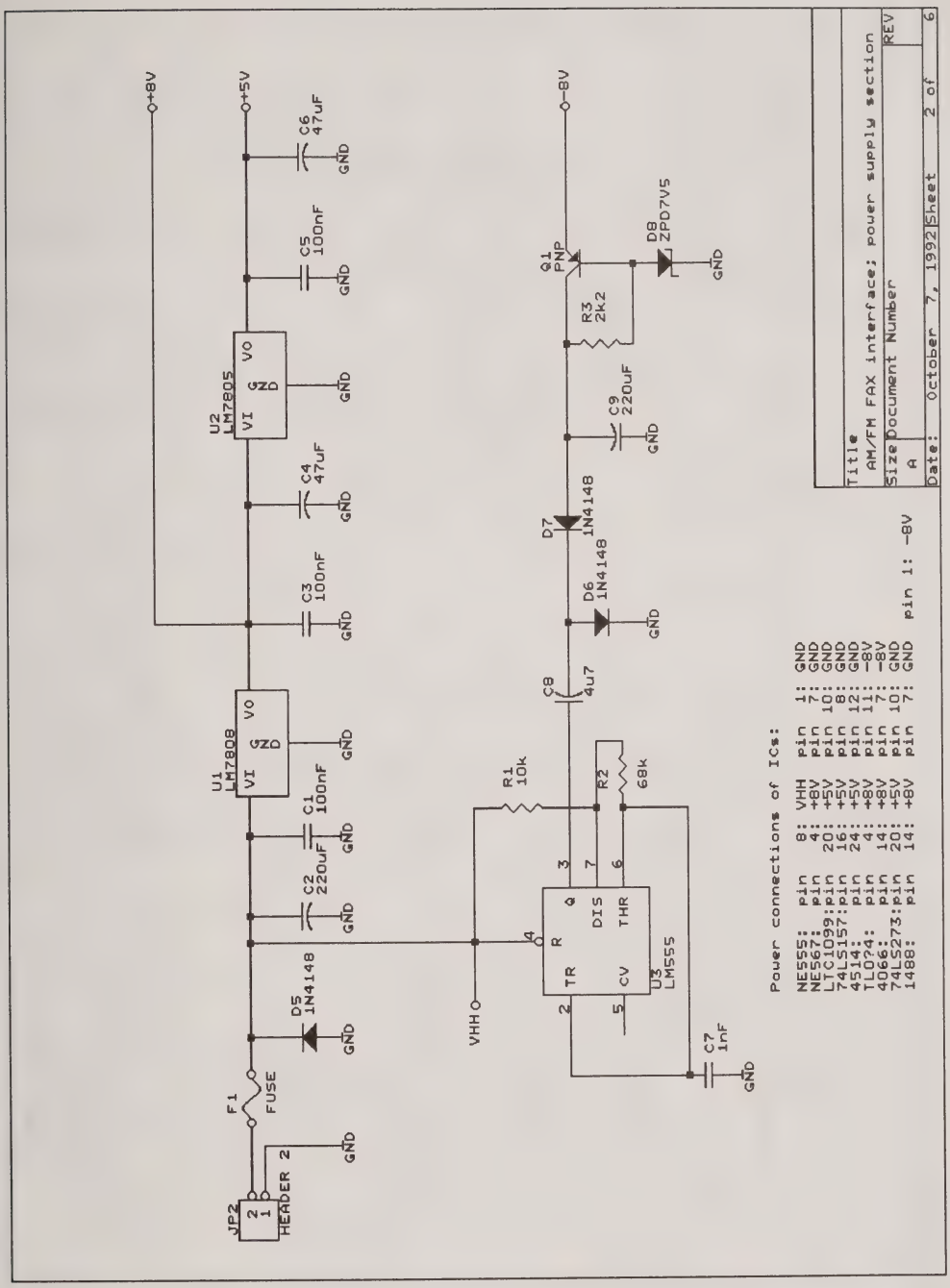
For transmitting purposes you can choose between a parallel or serial output, or a signal output using the PC's built in speaker. The speaker signal can directly drive the transmitter after having passed some low-pass filter stages. In all transmitting modes the maximum intensity resolution is limited to 64 levels.

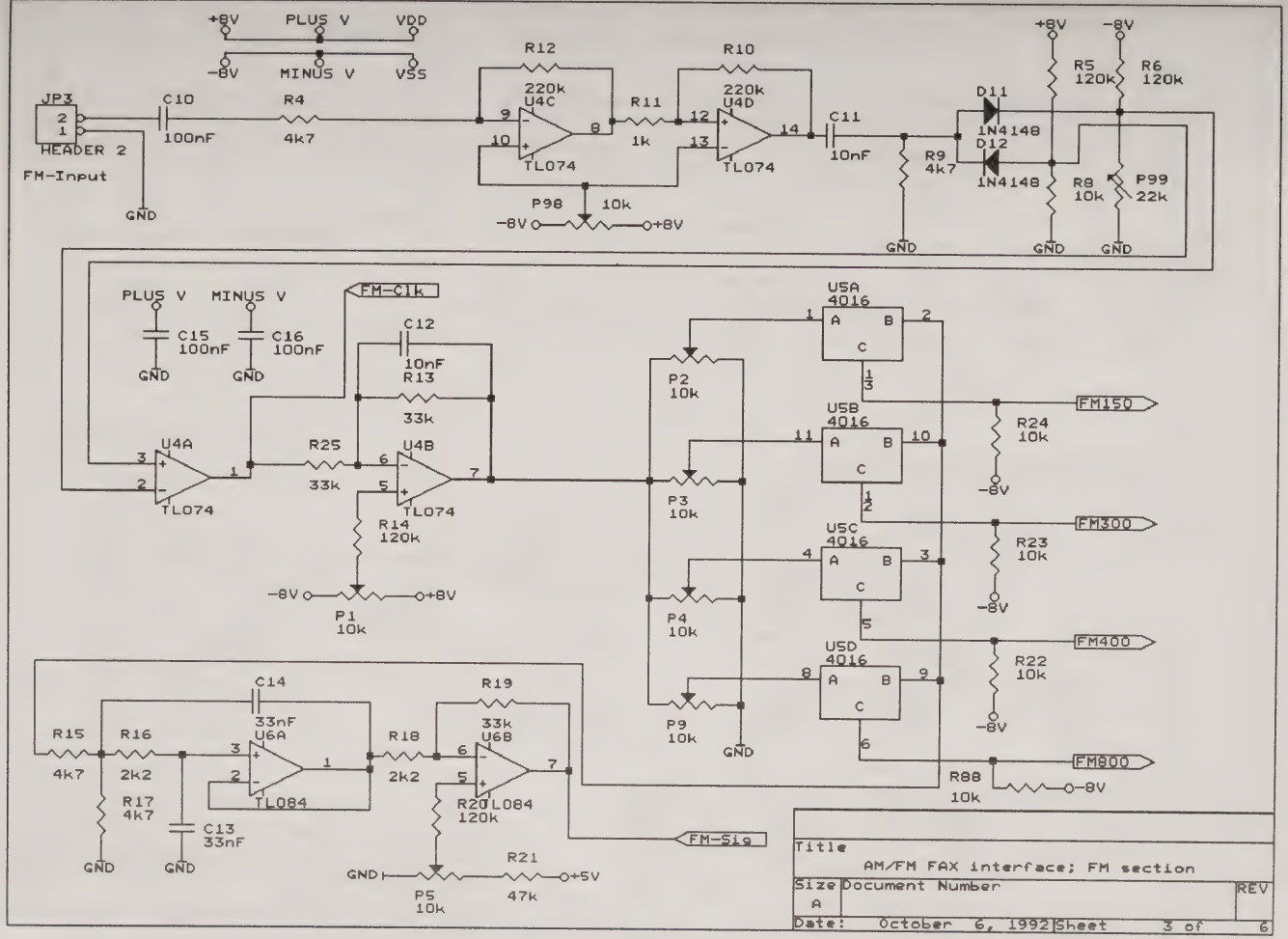
The software for JVFAX v5.1 can be obtained through the GIF Library on Disk 99B, or can be downloaded via the RIG Bulletin Board; but beware, it is a large 318kb file and could take some while to retreive on a slow modem!

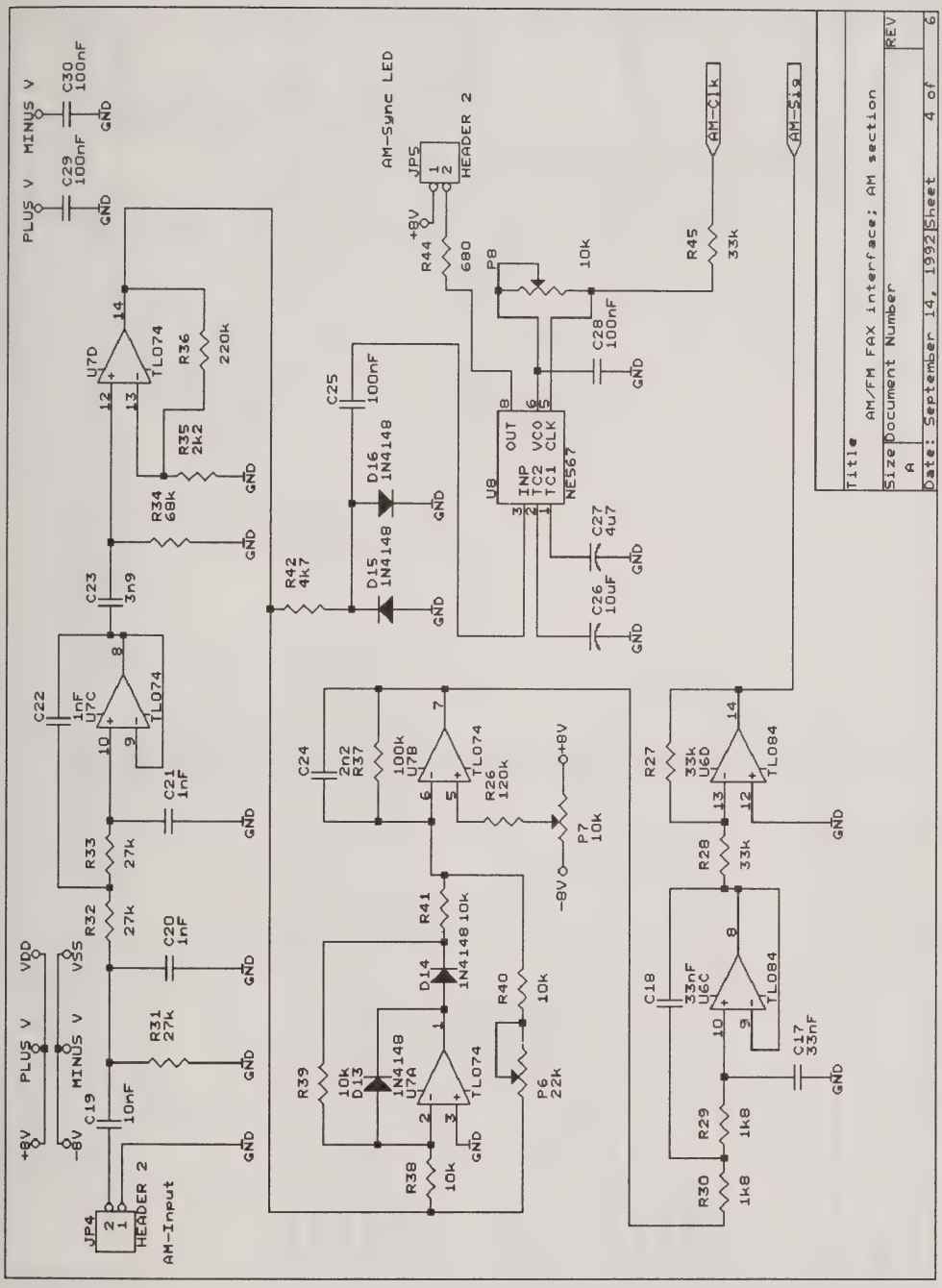
JVFAX v5.1 is neither Shareware or Public Domain, but is made available to members and those interested in Weather Sat/Fax Reception and Transmission free of charge. If, however, you send a donation to the author he will keep you informed of further new releases etc. You are invited to distribute it provided no charge is made (other than the cost of the media). The program is not, however, to be used in connection with any commercial application.

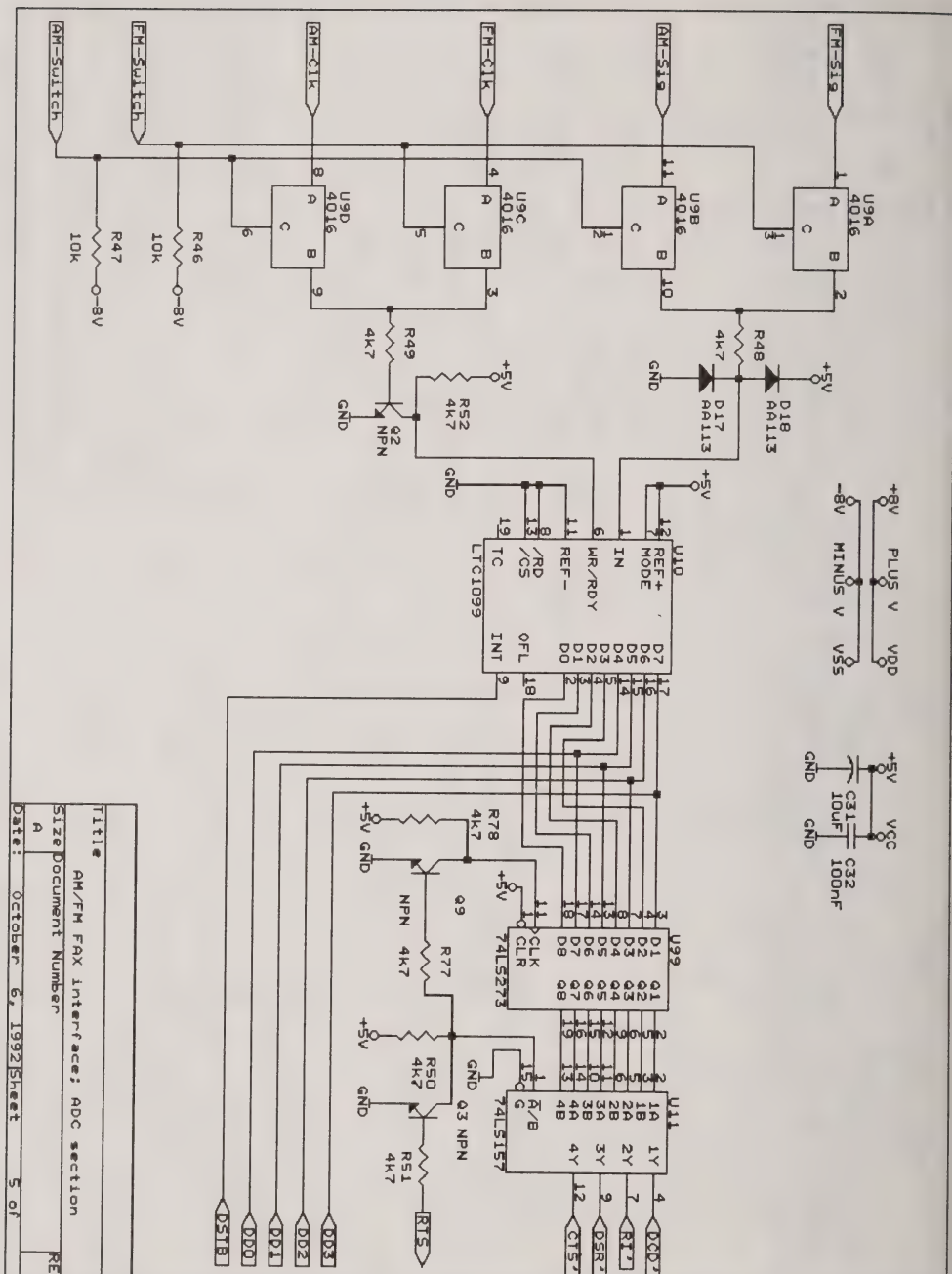
[The author informs us that there are still a few minor bugs, but in general the program works fine. He also informs us that there is also another interface available (which needs no alignment) from Ultrich Bangert, in Germany, which is in the form of a professionally looking kit, costing about 280 DM. Using the simple serial interface, this could be the cheapest way yet to start receiving WXSAT pics. Mike]

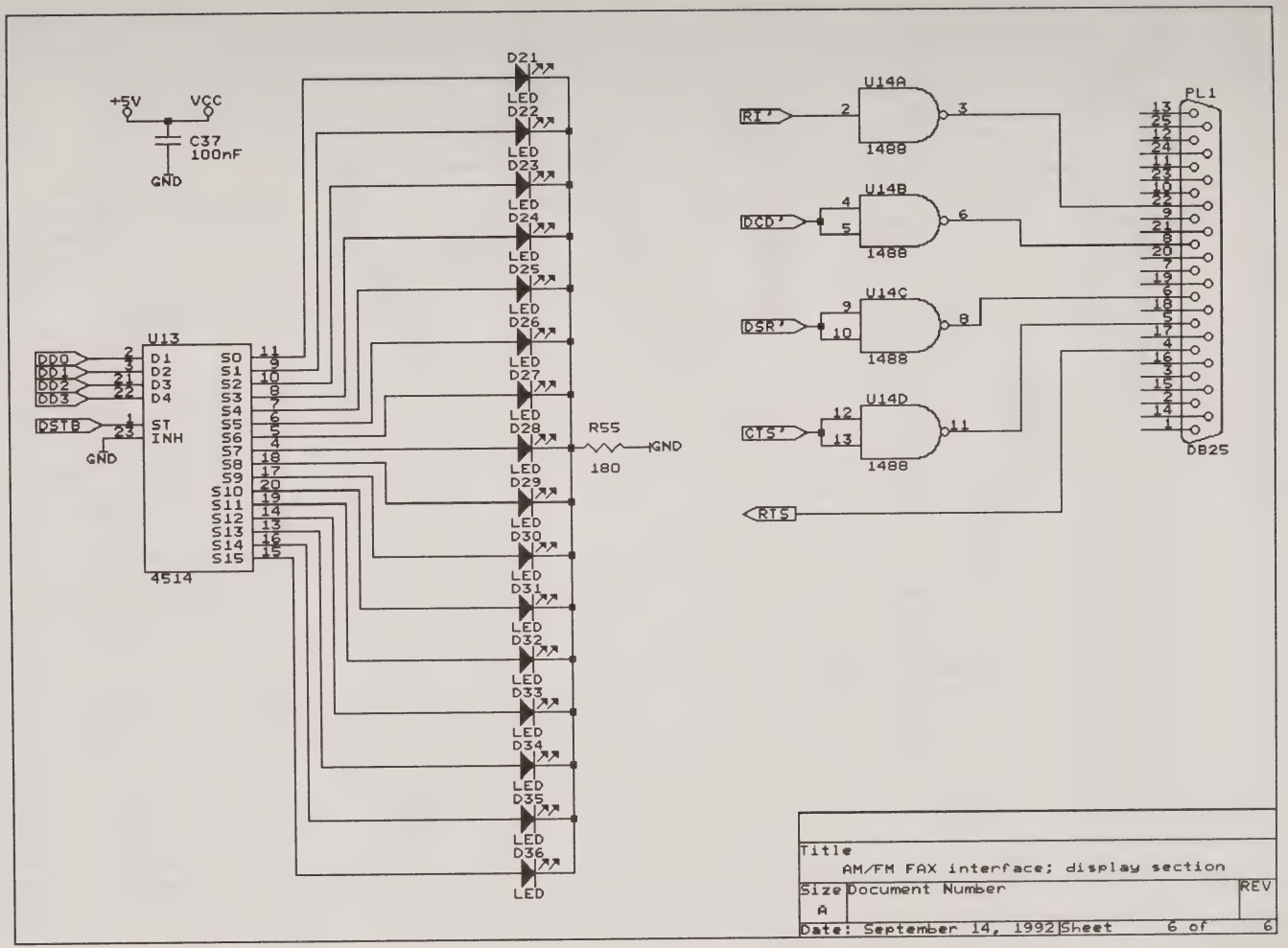

M[0..3]
Power supply
AM-section
FM-section
M0
M1
M2
M3
FM150
FM300
FM400
FM800
AM-Sig
AM-Clk
FM-Sig
FM-Clk
M0
M1
M2
M3
D3
1N4148
D2
1N4148
D1
1N4148
D0
1N4148
ADC-section
FM-Sig
FM-Clk
AM-Sig
AM-Clk
FM-Switch
AM-Switch
DCD'
RI'
DSR'
CTS'
DSTB
DD0
DD1
DD2
DD3
Display-section
DCD'
RI'
DSR'
CTS'
DSTB
DD0
DD1
DD2
DD3
FM400 (ATC)
FM400
FM150 (ATC)
FM150
AM
Mode-Switch
SW1
1RSW6
+8V
Title
AM/FM FAX interface
Size
A
Document Number
REV
Date: September 14, 1992
Sheet 1 of 6

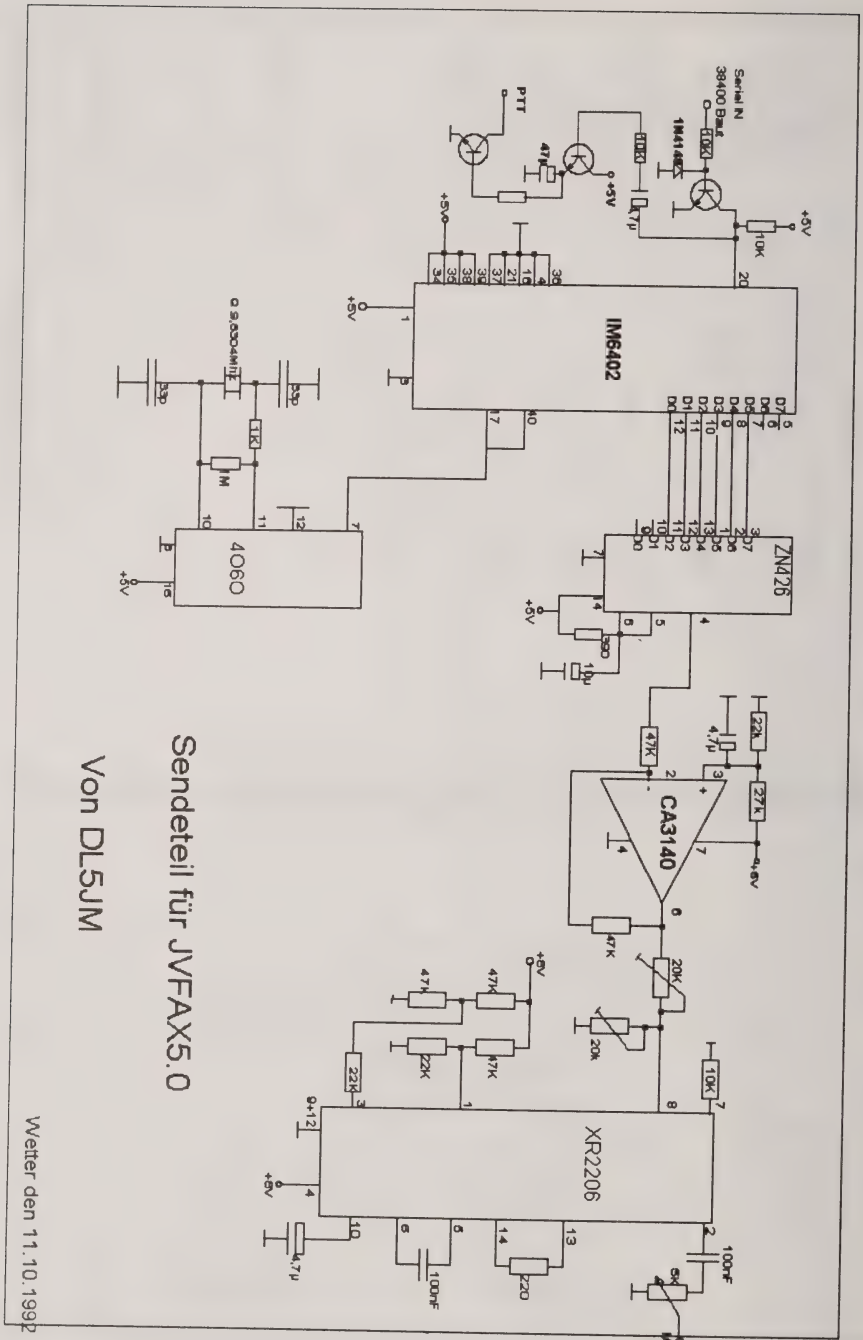

+8V
+5V
U1 LM7808 VI GND VO
U2 LM7805 VI GND VO
C1 100nF
C2 220uF
C3 100nF
C4 47uF
C5 100nF
C6 47uF
GND
F1 FUSE
JP2 HEADER 2
D5 1N4148
VHH
R1 10k
R2 68k
C7 1nF
C8 4u7
U3 LM555 TR R Q CV THR DIS
D6 1N4148
D7 1N4148
Q1 PNP
R3 2k2
C9 220uF
D8 ZPD7V5
-8V
Power connections of ICs:
NE555: pin 8: VHH pin 1: GND
NE567: pin 4: +8V pin 7: GND
LTC1039: pin 20: +5V pin 10: GND
74LS157: pin 16: +5V pin 8: GND
4514: pin 24: +8V pin 12: -8V
TL074: pin 4: +8V pin 11: -8V
4066: pin 14: +8V pin 7: GND
74LS273: pin 20: +5V pin 10: GND
1488: pin 14: +8V pin 7: GND
pin 1: -8V
Title
AM/FM FAX interface; power supply section
Size A
Document Number
REV
Date: October 7, 1992 Sheet 2 of 6


+8V
PLUS V
VDD
-8V
MINUS V
VSS
JP3
HEADER 2
FM-Input
C10
100nF
R4
4k7
GND
R12
220k
U4C
TL074
R11
1k
R10
220k
U4D
TL074
C11
10nF
P98
10k
-8V
+8V
D11
1N4148
D12
1N4148
R9
4k7
R5
120k
R6
120k
R8
10k
P99
22k
PLUS V
MINUS V
C15
100nF
C16
100nF
FM-Clk
C12
10nF
R13
33k
U4A
TL074
R25
33k
U4B
TL074
R14
120k
P1
10k
U5A
4016
U5B
4016
U5C
4016
U5D
4016
P2
10k
P3
10k
P4
10k
P9
10k
FM150
FM300
FM400
FM800
R24
10k
R23
10k
R22
10k
R88
10k
C14
33nF
R15
4k7
R16
2k2
U6A
TL084
R17
4k7
C13
33nF
R18
2k2
R19
33k
U6B
TL084
R20
120k
FM-Sig
R21
47k
+5V
P5
10k
Title
AM/FM FAX interface; FM section
Size
A
Document Number
REV
Date: October 6, 1992
Sheet 3 of 6


AM/FM FAX interface; AM section
Size A
Document Number
REV
Date: September 14, 1992
Sheet 4 of 6
AM-Input
AM-Sync LED
AM-Clk
AM-Sig
HEADER 2
TL074
TL084
NE567
1N4148


FM-Sig
AM-Sig
FM-Clk
AM-Clk
FM-Switch
AM-Switch
U9A 4016
U9B 4016
U9C 4016
U9D 4016
R46 10k
R47 10k
R48 4k7
R49 4k7
R52 4k7
D17 AA113
D18 AA113
Q2 NPN
+5V
GND
-8V
+8V
PLUS V
MINUS V
VDD
VSS
VCC
C31 10uF
C32 100nF
U10 LTC1099
REF+
MODE
IN
WR/RDY
REF-
/RD
/CS
TC
OFL
INT
D7
D6
D5
D4
D3
D2
D1
D0
R78 4k7
R77 4k7
R50 4k7
R51 4k7
Q9 NPN
Q3 NPN
U99 74LS273
CLK
CLR
U11 74LS157
A/B
G
1A
1B
2A
2B
3A
3B
4A
4B
1Y
2Y
3Y
4Y
DCD'
RI'
DSR'
CTS'
RTS
DSTB
DD3
DD2
DD1
DD0
Title
AM/FM FAX interface; ADC section
Size
A
Document Number
REV
Date: October 6, 1992
Sheet 5 of 6


+5V
VCC
C37
100nF
GND
U13
DD0
DD1
DD2
DD3
DSTB
D1
D2
D3
D4
ST
INH
S0
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
4514
D21
D22
D23
D24
D25
D26
D27
D28
D29
D30
D31
D32
D33
D34
D35
D36
LED
R55
180
U14A
U14B
U14C
U14D
1488
RI'
DCD'
DSR'
CTS'
RTS
PL1
DB25
Title
AM/FM FAX interface; display section
Size
A
Document Number
REV
Date: September 14, 1992
Sheet 6 of 6


Sendeteil für JVFAX5.0
Von DL5JM
Wetter den 11.10.1992
IM6402
ZN426
CA3140
XR2206
4060
PTT
Serial N
38400 Baud
MIC

ARCHIVING WXSAT PICS ON THE PC

Mike Goodall

With the increasing use of computers (in particular PCs) to receive weather satellite pictures, there has evolved a problem of archiving. In the days of the Framestore, if you wanted to save the picture, you could either photograph it from the screen or save a few seconds of it on a standard video recorder.

With the introduction of the Timestep packages, and others, you may have on your hard disk a file of up to 3Mb (.NOA image in ProsatII) or nearly 100Mb in the case of a PDUS or HRPT image. Even the humble .DAT image is 500kb in size. Even if you have a large hard drive, you would soon run out of space. With 1.4Mb disks obtainable as cheap as 40p each you still need a lot to archive pics on a regular basis. Tape streamers are one option, and second hand early types can be found for £40 to £100 for 60Mb or more storage capacity. The only problem is the price of the spare cassettes. These can be over £10 each. Another disadvantage is that, even if you have the software to save individual files on this system, it can take many minutes to locate the required file on the tape. As you can imagine, back at the GIF Library desk, archiving can be a big problem, and until recently the only thing to do was to save the entire image, in GIF form, around 250kb to 500kb long. Along came the Neopaint Shareware package and the problem was to some extent solved.

If you receive a stunning image that you can't bare to loose, take a second look. The chances are that the stunning part will be only a fraction of the area of the whole image. It is not unusual, especially with the Russian Mets, to have three quarters of the image covered in low grey cloud with no detail showing through. There seems little point in saving this section; being best to concentrate of the section of interest. The best way to save this is to display the whole image on the screen and do a 'screensave'.

There are several ways to do this. The ProsatII package has 'ALT/s' which save in the Colorix format .SCF (for 640 x 480 x 256) and .SCO (for 1024 x 768 x 256). It also has the 'ALT/X' command for saving in PCX format. The .SCO file is 777kb in size for 1024 x 768 format and the .PCX is 888kb for the same format. A word of warning if you save the picture in a zoom mode it may look rather 'pixelly' when finally finished. I you converted this whole picture reduced .GIF format the whole file may be reduced to 300kb or less.

However you probably won't need the whole picture anyway; so your final .GIF image may only be 50kb to 150kb in size. A long way from the original 3Mb long .NOA file you started with.

The best way to proceed is to save the screen, after you have coloured or contrasted it with a palette, in .PCX format with the 'ALT/X' command. Don't forget to move the mouse pointer to the top right of the screen so that it doesn't appear on the final image. You wouldn't believe how easy it is to forget! You now have a 888kb file which contains exactly the image you saw on the screen. It contains the entire data and is not compressed. An alternative would be to save the screen in .SCO format and change this with VPIC into GIF format, but this seems a waste of time. NOATIF will also convert .DAT and .NOA files to TIF format but it wont contain the palette, only the original file!

Move the file to your Neopaint directory and run Neopaint. Load in the file, and it will appear as it did originally, except the window on Neopaint will show all but the bottom and left of the picture until you scroll it with the window type controls.

The next step is to drastically reduce the size. The smaller the file, the quicker the program will work on the various processes you will require. Select the scissor box at the top left and place the mouse pointer at the top left hand corner of the portion of the image you want to save. Hold down the left mouse button and drag the rectangle out to cover the required part. Let go and you will see the section surrounded by a faint box with small square box corners. Select the Edit Menu at the top and the select 'Copy to'. Click on this and a box will appear on the centre of the screen inviting you to name the image. Use a suitable name that describes the area i.e. 'Greenlnd' of not more than 8 characters and then click the small box that describes the type of file... .PCX, .GIF, etc. and then click on .GIF. This will save your section as a compressed .GIF file.

Select File Menu again and click on Clear. This will clear your original full size image. Next, click on 'Open' and load in your new .GIF file. You can at this stage alter the Contrast or Brightness, but this should have been done in ProsatII with the superior palette system! The Neopaint options are nowhere near so convenient or accurate.

The next operation is to title the picture. Select the background colour of your title box by clicking the mouse button on one of the colours displayed down the left of the screen. The dark blue is by far the best. Next click on the grey box option, at the top of the screen, containing the square. Place the mouse pointer at one corner of the picture and draw out the box long enough to get your title in. Around a quarter of an inch wide and 3" long on a 14" monitor will probably be enough; or you can go straight across the top or bottom of

the picture. When you let go of the mouse button it will draw your coloured box where you positioned it.

Next click on the Text box (A) at the top and then the bottom right-hand corner of the text box. This will give you a menu to select the fonts. A selection will be displayed in the centre of the screen in a panel. Select 'HELGA' and the 13 point size. Click on 'OK' and the box disappears. This font and size is by far the most readable and convenient of all those supplied. Click the mouse pointer (now a small upright line) at the beginning of the box and type in the data in Capital letters and numbers.

The best information to include is the satellite, time and date, Visual or IR, the location of the principal interesting part of the image, and your name. A typical line would read "MET3-4 20 FEB 1993 12.30 GMT GREENLAND FRED SMITH".

You can delete backwards if you make a mistake but you can't insert spaces or do anything else. If you make a fatal error, don't worry; just draw the blue box again over the previous one. At this stage a 'save' would be a good idea.

The next operation is to clean up any noise on the picture. This is time consuming, but well worth the trouble. (A few purists will probably shudder at the thought of this, as they will say that you are changing the data or inventing it... but we won't tell them and they'll never notice when we've finished).

Click on the zoom box and pull out a box with the mouse pointer around an area that has a few pixels of noise; normally a white or black spot. Beware; a small single spot or a couple in a line, with totally different values are probably noise; but a spot covering several pixels deep and wide is probably a genuine feature. A small box selected will give you large pixels to work with, whereas a large area selected will give you small pixels. An enlarged portion with pixels will appear at the centre of the screen.

You can increase or decrease the magnification with the slide to the left; and the portion of your picture is displayed in a thumbnail sketch at the top. Click on a grey square from the palette selection at the left which corresponds roughly to a pixel that is adjacent to the interference spot and click over the spot. This will change the spot to one similar to the surrounding pixels.

You can select the exact grey scale or colour from the bottom part of the palette section, but for most cases one of the eight or so colours or greys at the

top section will suffice. Remember that when you have a colour or grey selected you can click over as many pixels as you wish, and if you hold down the button you can slur over a larger area while moving the mouse.

A few tips... you will notice that there are very few pixels adjacent to each other that are exactly the same. If you change large areas of pixels to exactly the same shade this will look wrong on the final result. To eradicate a whole line of interference start at the left and when that area has been done, hold down the mouse button on the slide at the bottom of the window, move it to the right; this will select the next area to work on. It may take 20 mins or so to eradicate a whole line of interference, but it makes the world of difference to the final result. When you have finished cleaning up the section, click on the zoom box again to see the altered picture full size on the screen. You will undoubtedly find some more areas that need cleaning up! When you are satisfied, do a final 'save'.

Another thing that Neopaint can do for you is to recover an image that has slipped sideways during reception (i.e a Russian MET received in Synchronous mode). These were normally discarded, but no more.

The sequence of pictures in the centre fold of this Journal will illustrate just how much can be achieved. Firstly you need to save the screen in PCX format and transfer the file to the Neopaint directory.

Click on the 'Scissor' box and draw a rectangle around the section that has slipped. Click again and place the 'hand' symbol over the section. You can now move it to the left or right to align it. Use the sync bars at the side as a guide. (Don't be tempted to move it up or down to erase the noisy lines at the join, or the finished result will look as though a portion of the picture has been lost.) Move the cursor away from the picture and it will lock into place. Do a 'save' and then continue to remove the noise in the zoom mode. If done successfully, you 'can't even see the join', as they say!

Your finished result will be a GIF file of perhaps as small as 100kb or less, and these can be stored on a 1.4Mb floppy disk. You could get up to 14 or more of these GIF files on a disk, a far cry from the original 500kb .DAT or the 3Mb .NOA file.

Although there are other ways to save your pictures, the GIF format is by far the most economic with file size. There are other commercial and Shareware programs that will work with PCX files, but Neopaint is by far the easiest and cheapest.

INTERPRETING WEATHER SATELLITE IMAGERY - PART 4

Peter Wakelin

Many readers will have seen the upper-air charts on Meteosat channel A2 and I know that a number of our members also receive charts by HF radio fax from various sources. In just a couple of pages I shall attempt to show how the upper-air pattern relates to images of that common feature, the frontal depression.

My PDUS infrared image was received on 7th April at 12.00 from Meteosat 4. The surface analysis and the upper-air data were extracted from charts received by radio fax from Bracknell and Offenbach respectively. I have copied the surface fronts onto the 500mb chart.

First, a few words about upper-air charts in general. They fall into two distinct types; those used by Meteorologists, like the one I have reproduced, and others designed for use in aviation. Those used by meteorologists are often contours of heights above mean sea-level of a standard pressure level, such as 700, 500, 300 millibars, etc. Units of height are normally decameters and contour intervals are usually 60 metres. The HectoPascal is numerically equal to the millibar and is now used in some countries. These contour charts often have lines of equal temperature drawn on them as well. Those disseminated from Meteosat at 08.50 and 20.50 are of this type. Like the isobars on surface charts the contours on upper-air charts give a good approximation to the direction of flow of the air, and the closer the contours, the stronger the wind.

I think it is quite obvious that the height of a given pressure level depends on the sea-level pressure and the mean temperature of the air between sea-level and that pressure level. The sea-level pressure is typically around 1000mb, so if the height of the 1000mb level is subtracted from the 500mb level, then we have the thickness of the layer between 1000mb and 500mb. Most thickness charts are drawn for this layer as it contains most of the weather. I shall shortly show how useful these charts are in analysing weather patterns. Thickness lines are traditionally drawn as broken lines with numerical values in square brackets.

Upper-air charts for aviation are issued for the same standard pressure levels, but different height units are employed. Worldwide, (well, almost) aircraft altimeters are calibrated in feet, and Flight Levels are in units of 100 feet. Airliners cruise at around the 250mb pressure level which is approximately 1050 decameters or FL340. Wind speeds are generally shown as "feathers" on a direction line at fixed intervals over the chart, typically at 5 or 10 degree

intervals of latitude and longitude. Short and long feathers represent 5 and 10 knots, and a triangular one 50 knots. temperatures appear alongside the wind data. The 14.50 Meteosat transmission takes this form.

Now let us look at the Meteosat imagery and the charts. I briefly described the formation of a frontal depression in RIG31 and wrote how a bulge of warm. moist air pushes polewards into colder air. The image shows a mature, deep depression southwest of Iceland, and a well-defined cold front lying north-south near 20 degrees west. A warm front over the UK is marked by a band of cold, high cloud. The 500mb contour chart shows very well how the formation of the depression has distorted the flow at about 5.5Km altitude and created a well-pronounced ridge over western Europe. Remember that greater contour heights and thicknesses mean warmer air.

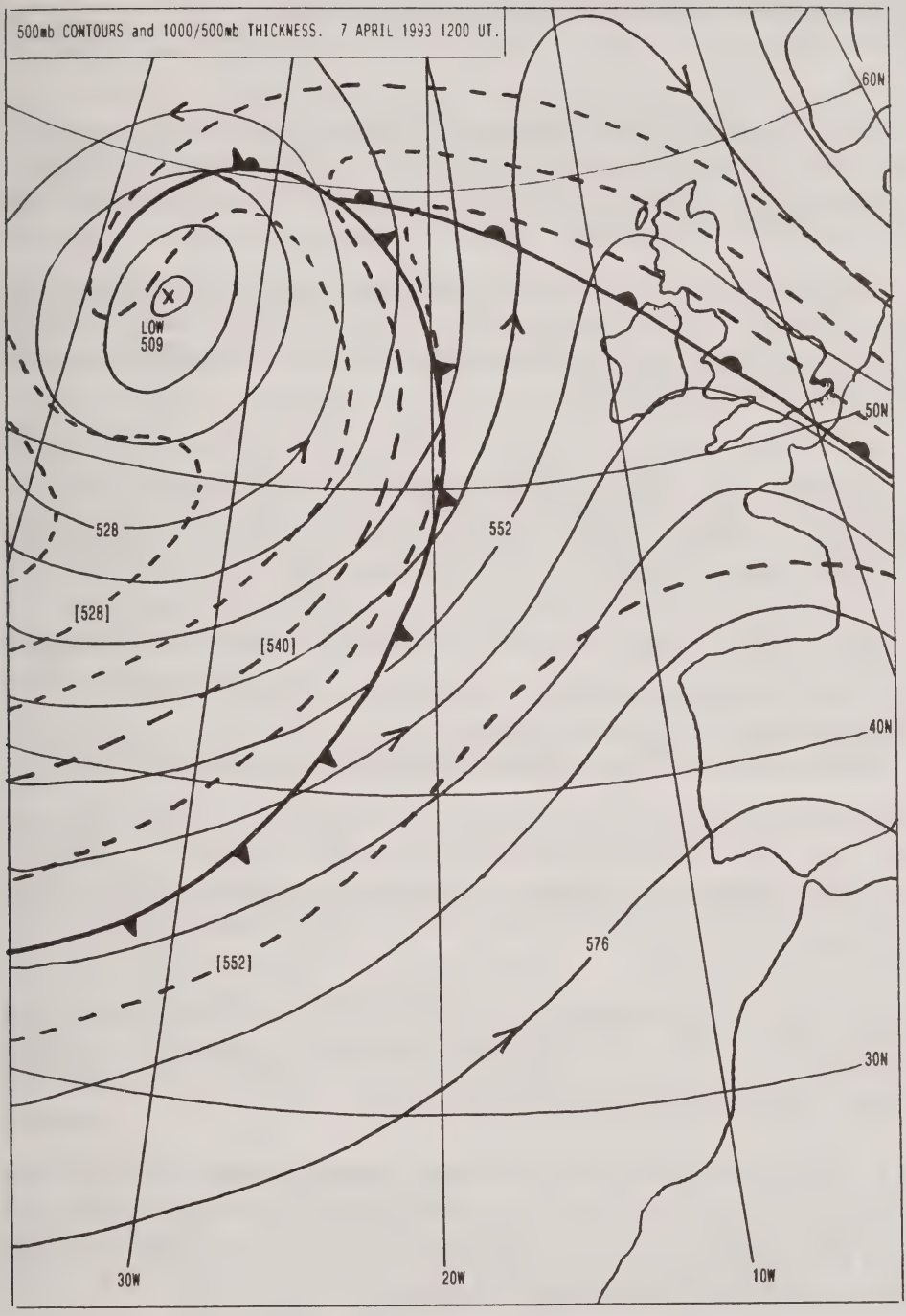
Note that the position of this ridge bears little relationship to the frontal positions. Remove the effect of surface pressure variations by subtracting the height of the 1000mb level, and you can see that the resultant thickness lines closely follow the pattern of the fronts. This is not really surprising, as the fronts mark the boundary between two different airmasses, and maximum contrast in temperature (and hence thickness value) occurs there.

West of the cold front, especially near to 50 degrees north, the thickness lines are very close together. Here there is an abrupt change from the low, warm cloud evident in the Bay of Biscay in the warm sector, to the colder, convective shower clouds west of 25 degrees west.

Further west the air is even colder, with thickness values below 528 decameters, and more extensive convection is taking place over the warm sea. 528 decameters is considered to be the value below which precipitation will probably reach sea level as snow.

By comparing the surface and 500mb flows, it is possible to locate areas where there is a marked change in wind direction with height. Take northern Britain, for example. Here the low level flow is light, southerly; yet at 500mb a stiff northwesterly is blowing.

This has been just a brief introduction to the complex subject of upper-level meteorology, In future editions I plan to look at large-scale circulation, jet-streams, and an attempt to take some of the mystery out of water-vapour images. Meanwhile, if you are outside, and notice that shallow stratocumulus is drifting up from the south, while high cirrus is hurtling down from the northwest, you might wonder if a warm front is approaching. It probably is.


500mb CONTOURS and 1000/500mb THICKNESS. 7 APRIL 1993 1200 UT.
60N
50N
40N
30N
30W
20W
10W
LOW
509
528
552
[528]
[540]
[552]
576

CONVERTING AMIGA IFF FILES TO PC FORMAT

Ulf Jander

For display and storage of the APT signal on the Amiga I use the German software Amiga-FAX from Volter Wertig in Ingelheim. The raw file format you get from the reception has to be converted to standard Amiga IFF format in a rather tedious process, by the use of more than five year old software. Every converted 640 x 400 screen gives a 128kb file.

I have found that it was not possible to convert these Amiga IFF files directly into PC format. I usually do geometrical corrections of the pictures with the PIXmate software for Amiga. The Amiga IFF files saved from PIXmate are OK for conversion to PC format.

Now for the conversion, which is made in two steps, with DOS-2-DOS software for the Amiga and HIJaak software for the PC. Using DOS-2-DOS you need an Amiga (model 500 in my case) with an extra drive. From DOS-2-DOS you first define one drive, i.e. df1: to be used with PC formatted disks, and the internal drive df0: to be used with Amiga disks. With DOS-2-DOS you can now format 720kb PC disks to PC format in df1:. Now put in the disk with the Amiga files in df0: and the empty PC disk in df1: and type the following command line...
copy df0: <amigafilename> df1: <filename.IFF> *(PC format on name)*
and press enter. This was the first step.
Regarding DOS-2-DOS, I don't know if it is shareware or commercial.

HIJaak is a commercial file conversion program for the PC from Inset Systems Inc, USA and should be available from software suppliers. It is used for graphics viewing, conversion and screen capture. Regarding file conversion, it can handle about 60 different formats, including Amiga, GIF, PCX, TIF (in 34 varieties) and MAC.

The second step is just to put the PC disk in a PC loaded with HIJaak, load the file <filename.IFF>, decide amongst the options and choose "save as". Then you decide if you want the file saved as <filename.GIF> or <filename.PCX> and to which drive or directory. And that's it!

You can use the "IMPROCES" shareware program *(available on disk 99)* to change the format to 640 x 480 and add the text. I have also experimented with IMPROCES to convert the 16 greyscale Amiga files to 256 greyscale files, and that works as well. I used the 'Image processing' facility with 'Area Histogram' and 'Contrast Stretch' commands.

METEOSAT DIGITAL SYSTEM - A PRIMARY DATA USER STATION

Guido Emiliani I4GU, Claudio Pagnani, Marciano Righini I4MY

The system that disseminates the Meteosat digital images is called HR (High Resolution) and is designed for PDUS (Primary Data User Stations). First we will examine the data coding scheme used by ESA, then we will describe a receiving station that can display, store, process and print the HR formats.

Characteristics of Digital Transmissions

Geographic formats - The A-format represents the whole earth-disc (fig.1). B-format represents the northern part of the disc with Europe in the middle. (fig.1). X-format represents the North and South American Continents (fig. 2).

Channels or spectral bands - The radiometer of Meteosat can explore the Earth in three channels or spectral bands: visible VIS (0.4-1.1μm), infrared IR (10.5-12.5μm), water vapour WV (5.7-7.1μm). The IR and WV images are transmitted inverted relative to WEFAX, i.e. black is cold and white is warm.

Image - An image consists of a number of lines belonging to the same slot and the same spectral band.

Transmission formats - A transmission can contain image data belonging to one, two, or three spectral bands. The formats actually transmitted are:

A-format

AV	2500 lines VIS1 x 5000 pixels + 2500 lines VIS2 x 5000 pixels, min. 23.5
AI	2500 lines IR x 2500 pixels, min.6
AW	2500 lines WV x 2500 pixels, min.6
AIVH	2500 lines VIS x 2500 pixels + as AI, min. 11.8
TEST1	2500 lines x 2500 pixels, min.6

B-format

BIV	625 lines VIS1 x 2500 pixels + 625 lines VIS2 x 2500 pixels + 625 lines IR x 1250 pixels, min.3.8
BIW	625 lines IR x 1250 pixels + 625 lines WV x 1250 pixels, min.1.6
BIVW	625 lines VISX x 2500 pixels + 625 lines IR x 1250 pixels + 625 lines WV x 1250 pixels, min.3.1

X-format

LXI 1250 lines VIS or IR x 1250 pixels, min.1.6

Notes...

- VIS1 and VIS2 contain the data of the two visible channel sensors. When both are used, the earth-disc is subdivided into 5000 lines and the resulting resolution is 2.5 kms at the sub-point.

- VISX = VIS1 or VIS2. In some images the data of only one VIS sensor is transmitted.

- VH: only one VIS channel with data reduction (each second pixel); hence the line contains 2500 pixels instead of 5000.

- ATEST1 carries a grey scale with 16 sectors.

- As the scan goes from south to north, in B-formats the first line number is 1810, the last is 2434. The first pixel within the line is 626, the last is 1875 in case of IR and WV information. The first pixel within VIS lines is 1252, the last is 3751.

- As at the moment GOES-E is not operational, it was replaced by Meteosat 3. LXI represents the whole earth-disc as seen by Meteosat 3 which is located at 75°W. LXI carries only one channel which can be IR or VIS.

Construction of Frames and Sub-frames

Frames - The data stream is divided into blocks of words called frames. Each frame consists of 364 words of 8 bits. A frame contains a line segment. On this segment there are not only the image data, but also the data concerning synchronisation, identification, label, grid, etc. Obviously these are data fields to be ignored when displaying the image.

Sub-frames - A set of frames forms a sub-frame (the terminology is misleading: a sub-frame is longer than a frame). A sub-frame contains one image line (half line in case of full-resolution VIS data). The sub-frames are not all the same length: B- and X- format sub-frames are 4 frames long and A-format sub-frames are 8 frames long (see Table 1).

Elements of sub-frames - The fields used in data sub-frames are:
- Synchronisation word
- Identification word
- Label
- Fillers
- Grid information

We will examine only the fields and elements essential to the identification and visualisation of images.

Synchronisation word - It is identical in all frames. It consists of three bytes as follows: (MSB) 00000101 00001100 11011111 (LSB).

Format and frame identification word - It consists of one byte (8 bits). The 4 most significant bits identify the format (A = 0111; B and X = 0011). The least significant bits indicate the frame number within each sub-frame.

Label - Each sub-frame contains a 24-word label whose contents are as follows:

Bytes	Meaning	
1-2	Number of frames per sub-frame: 8 for A-formats; 4 for B- and X- formats	
3-4	Number of sub-frames in the transmission format	
5-6	Current sub-frame number	
7-8	Image line number. Headers = 0. First line in A- and X-formats = 1. First line in B-formats = 1810	
9-12	Image number from mission start	
13	Format indicator: A = 00; B = FF; X = 0F (hex)	
14	VIS1 indicator	00 = data not present; F0 = 1st half line present; 0F = 2nd half line present; in AIVH-format bytes 14 or 15 are set to FF
15	VIS2 indicator	
16	IR indicator	00 = data not present
17	WV indicator	FF = data present
18	Grid indicator:00 = grid not present; OF = grid present	
19	Annotation text indicator: 00 on current operations	
20	Scan direction: 00 = S-N and E-W; FF = N-S and W-E	
21-24	Spare: all bytes are set to 00	

NOTE: At the beginning of each transmission format there is a number of heading sub-frames and at the end there are one or two conclusion sub-frames which are a copy of the heading sub-frames. The description of the data

contained in these sub-frames falls outside the aim of this article.

Fillers - They are used to keep sub-frames at a fixed structure. The fillers, all set to 00, are as follows: SP1 and SP6 = 8 bytes; SP2 = 16 bytes; SP3 = not in use; SP4 = 1440 bytes; SP5 = 40 bytes.

Grid information - It is enclosed in each data sub-frame. The nth bit of grid information corresponds to the nth byte of the image data of the same data sub-frame, The bit is set to 1 if grid point is available.

- The grid information of A-formats consists of 316 bytes = 2528 bits. The first 2500 bits are the grid information corresponding to 2500 image pixels within the sub-frame. 28 spare bits are set to 0.

- The grid information of B-formats consists of 158 bytes = 1264 bits. The first 1250 bits are the grid information corresponding to 1250 image pixels within the sub-frame. 14 spare bits are set to 0.

- X-formats do not contain separate grid information. Grids and coastlines are superimposed on the images. The grid information field (158 bytes) is set to 0.

Table 1
Data sub-frames consist of 8 frames in A-format and 4 frames in B- and X-formats. The structure is as follows:

3 words	1 word	24 words			
Sync	Format ident.	Frame number 0000	Label	Filler: 40 words in A 8 words in B	Image data: 296 words in A 328 words in B
Sync	Format ident.	0001	Image data: 360 words		
Sync	Format ident.	0010	Image data: 360 words		
Sync word: 00000101 00001100 11011111	Most sign. 4 bits: 0111 = A format 0011 = B format	0011	Image data 202 words in B	Further image data in A Grid: 158 words in B	
		0100	Image data: 360 words in A		
		0101	Image data: 360 words in A		
		0110	Image data: 360 words in A		
		0111	Image data 44 words in A	Grid: 316 words in A	

1 B-format subframe

1 A-format subframe

364 words

Each A-format data sub-frame includes 2500 bytes (words) of image information.

This corresponds to 2500 image pixels and represents either one complete line of an IR or WV image or half a line of one VIS channel image.

In AIVH-formats, where only each second VIS pixel is transmitted, one sub-frame represents one complete VIS line.

Each B-format data sub-frame includes 1250 bytes (words) of image information. This corresponds to 1250 image pixels and represents one complete B-format line of IR or WV image or half a B-format line of one VIS channel image.

Construction of the Formats Actually Transmitted

AV-Format			**AI-Format**		
Heading: 42 sf = 336 fr			Heading: 42 sf = 336 fr		
Data: 10000 sf = 80000 fr			Data: 2500 sf = 20000 fr		
VIS2	1/2 line	1	IR	line	1
VIS2	1/2 line	1	IR	line	2
VIS1	1/2 line	1	IR	line	3
VIS1	1/2 line	1	IR	line	4
VIS2	1/2 line	2	IR	line	5
VIS2	1/2 line	2	IR	line	6
VIS1	1/2 line	2	IR	line	7
VIS1	1/2 line	2	IR	line	8
VIS2	1/2 line	3	IR	line	9
↓	↓	↓	↓	↓	↓
VIS1	1/2 line	2499	IR	line	2495
VIS1	1/2 line	2499	IR	line	2496
VIS2	1/2 line	2500	IR	line	2497
VIS2	1/2 line	2500	IR	line	2498
VIS1	1/2 line	2500	IR	line	2499
VIS1	1/2 line	2500	IR	line	2500
Conclusion: 1 sf = 8 fr			Conclusion: 1 sf = 8 fr		

AW-Format

Heading: 42 sf = 336 fr
Data: 2500 sf = 20000 fr

WV	line	1
WV	line	2
WV	line	3
WV	line	4
WV	line	5
WV	line	6
WV	line	7
WV	line	8
WV	line	9
↓	↓	↓
WV	line	2495
WV	line	2496
WV	line	2497
WV	line	2498
WV	line	2499
WV	line	2500

Conclusion: 1 sf = 8 fr

AIVH-Format

Heading: 42 sf = 336 fr
Data: 5000 sf = 40000 fr

IR	line	1
VISH	line	1
IR	line	2
VISH	line	2
IR	line	3
VISH	line	3
IR	line	4
VISH	line	4
IR	line	5
↓	↓	↓
IR	line	2498
VISH	line	2498
IR	line	2499
VISH	line	2499
IR	line	2500
VISH	line	2500

Conclusion: 1 sf = 8 fr

BIW-Format

Heading: 84 sf = 336 fr
Data: 1250 sf = 5000 fr

IR	line	1810
WV	line	1810
IR	line	1811
WV	line	1811
IR	line	1812
WV	line	1812
IR	line	1813
WV	line	1813
IR	line	1814
↓	↓	↓
IR	line	2432
WV	line	2432
IR	line	2433
WV	line	2433
IR	line	2434
WV	line	2434

Conclusion: 2 sf = 8 fr

BIVW-Format

Heading: 84 sf = 336 fr
Data: 2500 sf = 10000 fr

IR	line	1810
VIS2	1/2 line	1810
VIS2	1/2 line	1810
WV	line	1810
IR	line	1811
VIS2	1/2 line	1811
VIS2	1/2 line	1811
WV	line	1811
IR	line	1812
↓	↓	↓
VIS2	1/2 line	2433
WV	line	2433
IR	line	2434
VIS2	1/2 line	2434
VIS2	1/2 line	2434
WV	line	2434

Conclusion: 2 sf = 8 fr

BIV-Format.

Heading: 84 sf = 336 fr
Data: 3125 sf = 12500 fr

IR	line	1810
VIS2	1/2 line	1810
VIS2	1/2 line	1810
VIS1	1/2 line	1810
VIS1	1/2 line	1810
IR	line	1811
VIS2	1/2 line	1811
VIS2	1/2 line	1811
VIS1	1/2 line	1811
↓	↓	↓
VIS1	1/2 line	2433
IR	line	2434
VIS2	1/2 line	2434
VIS2	1/2 line	2434
VIS1	1/2 line	2434
VIS1	1/2 line	2434

Conclusion: 2 sf = 8 fr

A Primary Data User Station

Radio Frequency Section
The dish has a diameter of 2 meters and a f/d ratio of 0.35. The cylindrical horn is 13.2 cm long and has a diameter of 13.4 cm. Inside it there is a 3.8 cm long monopole soldered to a BNC coax connector placed at 4.4 cm from the rear of the horn. The preamplifier is connected directly to the horn output BNC and the converter is placed at the rear of the dish. We assembled a LNA kit supplied by RIG and used a Microwave Modules MMK 1691-137.5 converter. The receiver is an ICOM IC R-7000 which has an IF output at 10.7 MHz; we used this signal to drive the HR decoding system. Do not forget that on the output pin there is also 9 V d.c., therefore the input capacitor in the 10.7 MHz filter /amplifier is a must.

10.7 MHz Amplifier and Bandpass Filter
As the signal level from the R-7000 is very low, we need amplification to drive the following stage. The filter of fig.4 is a critical section of the system. The bandwidth should be about 660 kHz at -3 dB. The almost continuous presence of Meteosat's HR signal helps a lot with the final adjustment.

Phase Demodulator
To demodulate the phase changes a fixed reference is required. The demodulator of fig.5 is based around a MC 1496P whose output, after passing through a low pass filter (IC2), controls the 10.7 Mhz VCO (TR4) which, in turn, provides the reference frequency to the MC 1496 phase detector. The post-detection low-pass filter is designed to cut above twice the bit rate (333.32 Khz). A dual-channel oscilloscope connected to the VCO and to the split-phase modulated input will show when the two signals are phase locked.

Split-Phase-Low to Non-return-to-Zero Decoder
We used a HD-6409/883 Manchester Encoder-Decoder (Harris Corporation), a chip which decodes Manchester code into NRZ code and provides clock recovery. After being regulated at 5 V by IC5, the s.p.1. data is fed into the decoder at UDI (Unipolar Data Input). SDO (Serial Data Out) provides decoded serial NRZ data synchronous with the decoder clock (DCLK).

The decoder requires a clock with a frequency 16x or 32x the data rate, The value is selected on the SS (Speed Selector) with SS low producing a 16x clock and high a 32x clock. We used the 32x mode, therefore the frequency of the free-running oscillator should be 5333.12 kHz so that it is synchronised by the incoming data (166.66 kHz x 32 = 5333.12 kHz) for its clocking. A frequency counter connected to the clock output (DCLK) is very useful to show when the internal clock is locked to the incoming data rate (166.66 kHz),

RST provides control of the decoder outputs: when RST is low, SDO and DCLK are forced low. We connected RST to the error signal in order to resolve the ambiguity problem. If a phase error (sync word) is detected by the sync word detector, the clock error pulse generated is fed into RST so that the phase of the clock is changed by 180 degrees.

Serial-to-Parallel Converter and Sync Detector
The unit of fig. 7 performs the following functions:

- it provides the parallel data in 8-bit words and interfaces them with the Memory Buffer Unit;

- it generates a line start pulse (sub-frame sync) at the fourth word of each sub-frame;

- at the fourth word of each sub-frame it generates a format-id pulse to indicate which format is being transmitted (high = A-format, low = B- or X-formats);

- at each frame it controls the clock phase and signals the possible phase error (sync word).

The serial-to-parallel conversion is performed by passing the serial data through a 32-bit shift register (IC8-9-10-11) clocked by DCLK, and deriving the parallel data from the fourth register (IC8). The 8-line bus is fed into a D-type register (IC 26) which is clocked by the word strobe (a high at the end of each word). The 8 parallel output lines are connected to the Memory Buffer Unit.

When the 32nd bit of each sub-frame enters the fourth register (IC8) a high (sub-frame sync or line start pulse) is generated at pin 5 of IC24. The sub-frames of high-resolution VIS formats contain only a half image line, therefore in these formats there is a start pulse each half line,

The second most significant bit of the fourth word (id-word) of the first frame is not used to generate the sub-frame sync pulse, but is used to recognise format: when the sub-frame sync pulse goes high, if this bit is high the format is A, if this bit is low the format is B or X.

The unit also detects the inverted sequence in order to resolve the ambiguity problem. The effect of a phase error is that the data appears inverted (0 instead of 1 and vice-versa). This situation is detected by checking the serial data for sync word as well as sync word and correcting the clock if sync word is found. This error signal, generated at pin 6 of IC25, is fed into the RST Input of HD-6409 (IC6).

Word Strobe Detector
The unit of fig.8 performs the following functions:

-it subdivides the clock pulse flow into 8-bit blocks corresponding to the words of data;

- it generates a word strobe at the last bit of each word;

- it counts the words and resets the system at the end of each sub-frame: after 4 frames for B- and X-formats, after 8 frames for A- formats.

When the sub-frame sync (line start) pulse is fed into the CK input of IC27A, Q goes high. Under this condition the clock pulses reach the divider by 8 (IC27B-28A-28B). Output Q puts on LED D5 indicating that the data is valid. The sub-frame sync pulse is also sent to the Memory Buffer Unit in order to establish the position of the image on the monitor screen.

At outputs Q and Q of IC28B we find the word strobe (20832.5 pps) which is a transition at the end of each word. The word strobe is applied to the Memory Buffer Unit to advance its counter A and to register IC26 to drive its CK input. The word strobe is also fed into counters IC33-34-35. The outputs of these counters are sent to the inputs P of comparators IC30-31 whose output CO produces a low pulse (P=Q) at the end of the count (sub-frame stop). The number of bytes in a sub-frame varies according to the format (2912 for A-format; 1456 for B- and X-formats); therefore, excluding the first 4 bytes of each sub-frame, the count must be 2908 for A-format and 1452 for B- and X-formats. The sub-frame stop pulse (P=Q) resets IC27A whose output Q goes low thus blocking the flow of the clock towards the divider by 8.

Both the sub-frame sync and the format-id pulses are applied to AND IC29B. When A-formats are transmitted, input 5 of IC29B will always remain low, therefore, in the absence of a signal, output Q of mono-stable IC38 will always remain high. When B- or X-formats are transmitted, input 5 of IC29B will go high together with input 4, therefore a pulse will reach input B of monostable IC38. Consequently Q will go low and remain low for the whole length of the format; in fact the mono-stable is re-triggered at each sub-frame and the values of the RC cell on pin 15 are high. Hence, Q of IC38 will always be high during the transmission of images of A-format and always low for those of B- or X-formats.

In multiplexers IC36-37 the lines go from A to Y when SEL is low and from B to Y when SEL is high. Outputs Y are connected to the comparators IC30-31 so that the latter generate the P=Q signal (sub-frame stop) after 2908 words for A-format and after 1452 words for B- and X-formats. Thus the system will be reset at the end of each sub-frame regardless of the sub-frame length.

Word strobe and sub-frame sync are connected to the Memory Buffer Unit by means of shielded cables if the path is long.

Image Display

To display the images there may be various solutions depending on the equipment available. In our system three modes of operation are possible:

1. The image can be displayed in real time on the monitor of a PC AT with a 512-kbyte, 256-colour VGA graphics adapter. The image can be processed as it is building up on the screen.

2. The image can be stored on hard disk (ours has a capacity of 70 Mbytes)

and displayed later on the PC monitor. Then it can be processed and zoomed; it is also possible to save only the areas of interest.

3. The image can be printed on photographic paper using a vintage Muirhead-Jarvis Picture Receiver type D-356-B.

Interfaces
In order to implement the above operations we built the following interfaces:

1. An interface between the computer and the outer circuits. It is the only plug in card installed inside the computer.

2. A Memory Buffer Unit which forms the incoming data flow into blocks and sends them to the computer main memory in bursts, thus creating intervals during which the computer can download the blocks from RAM to hard disk. In the printing mode the data is formed into blocks by the computer and sent in bursts to the Memory Buffer Unit which turns them into a continuous stream of digital data.

3. A D/A converter that provides analogue video which is filtered, amplified and chopped to modulate a 2.4-kHz signal provided by a clock generator. The AM remodulated signal is filtered and sent to the fax machine in order to get hard copies of the pictures.

The three interfaces were described in the article 'Storing Weather Pictures on Disk', we published in RIG Newsletter No.24,
March 1991, pp. 25-38.

Software
The data transmission rate is very high, therefore, if one cannot have the use of a fast computer and a fast hard disk, it is impossible to read and store the whole data flow sent by Meteosat. As the NOAA HRPT system has a simple transmission format structure, we could build an external circuit which selects the data of only one of the five spectral channels, thus reducing the information input to the computer by 80%. Such a solution is almost impracticable with Meteosat HR system as the complexity of the transmission format would require a highly elaborate circuit for the data selection. The strategy we adopted is that of sending the whole data flow to the computer, entrusting software with the task of reading and interpreting the information, and deciding which channel to display or store and which channel(s) to ignore.

Our programme interprets the data contained in the label (the first 24 bytes after the sub-frame sync pulse). First of all, byte 13 enables us to recognize the image format (A or B) and consequently to decide what length and structure the sub-frame will have. Bytes 7 and 8 (image line number) allow us to discard heading and conclusion sub-frames which are all set to zero.

Bytes 14, 15, 16, 17 indicate the type of spectral information contained in the sub-frame. Only one of these bytes has the value of 255 (FF), all the others are set to zero; this indicates that the sub-frame contains information of the corresponding spectral window. If this is the chosen window, the image data contained
in the sub-frame is displayed or stored, otherwise the whole sub-frame is ignored and the next one is examined.

In some formats the information of the visible window is supplied with a resolution which is double compared to that of the infrared and water vapour windows; consequently the pixels of a single image line occupy two consecutive sub-frames.

In this case the byte in the label corresponding to VIS, instead of being 255 (FF), has the value of 240 (F0) if the sub-frame contains the first half of the line, or 15 (0F) if the sub-frame contains the second half.

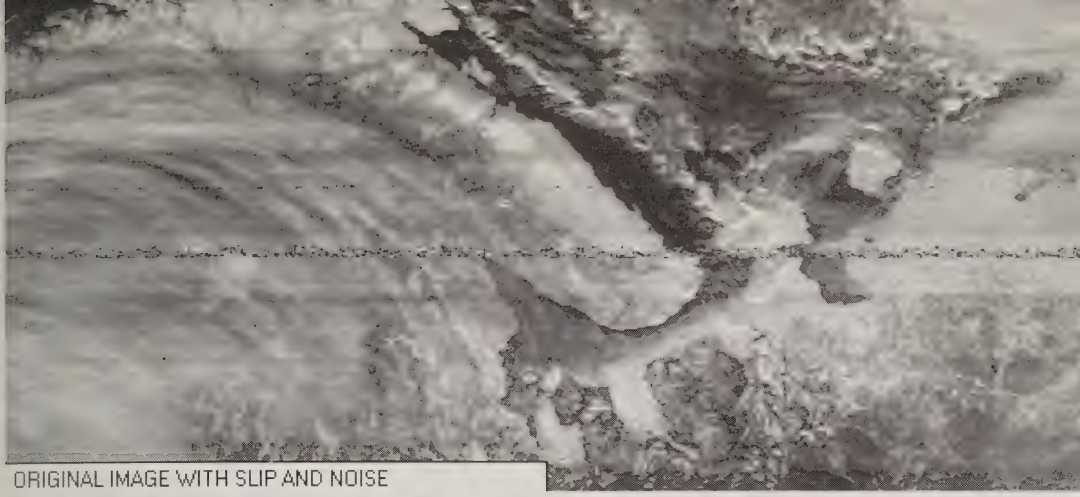
The length of the files differ greatly according to the formats: it goes from 1.5 Mbytes for one channel of BIW to 25 Mbytes for the full-resolution VIS image of AV-format.

The software, produced by Claudio Pagnani, covers APT, WEFAX, HRPT and HR. It runs only with the hardware described here and the interfaces described in our previous article. A disk containing all our programmes is available free to anybody.

Table 2
Meteosat HR System Characteristics

Frequency	Channel A2: 1694.5 MHz
Polarisation	Linear, horizontal
Carrier modulation	Digital split-phase-low
Bit rate	166660 bits/sec
Bits/word	8 (MSB transmitted first)

[If you are interested in building this project, please tell Henry! If there is enough interest shown, perhaps a PCB could be produced.]



ORIGINAL IMAGE WITH SLIP AND NOISE

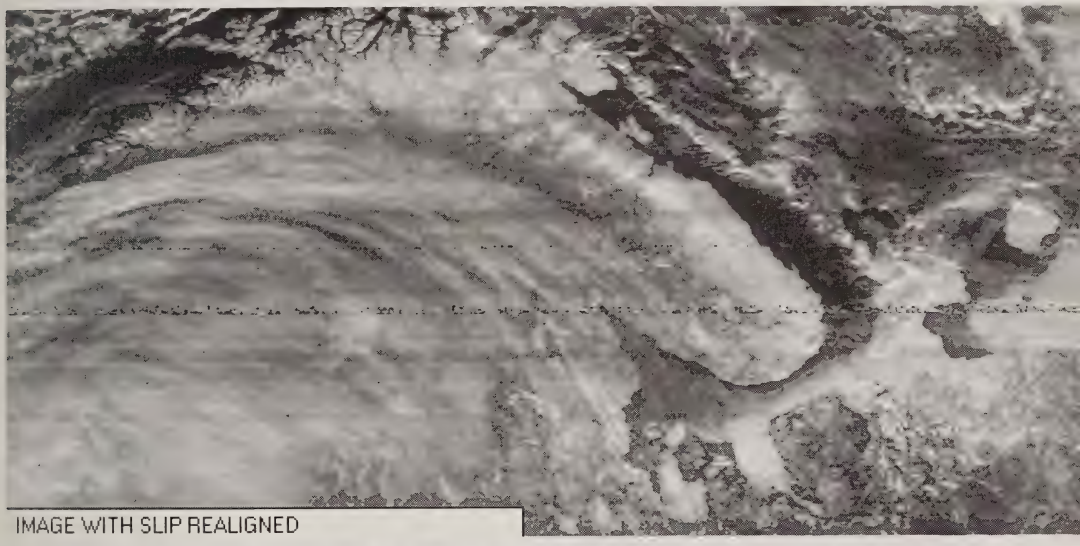
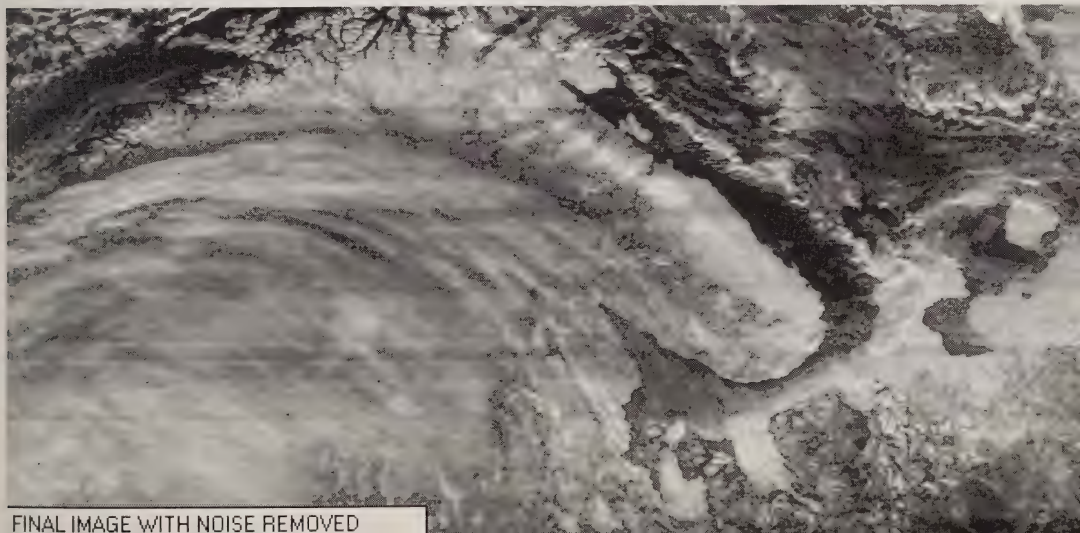
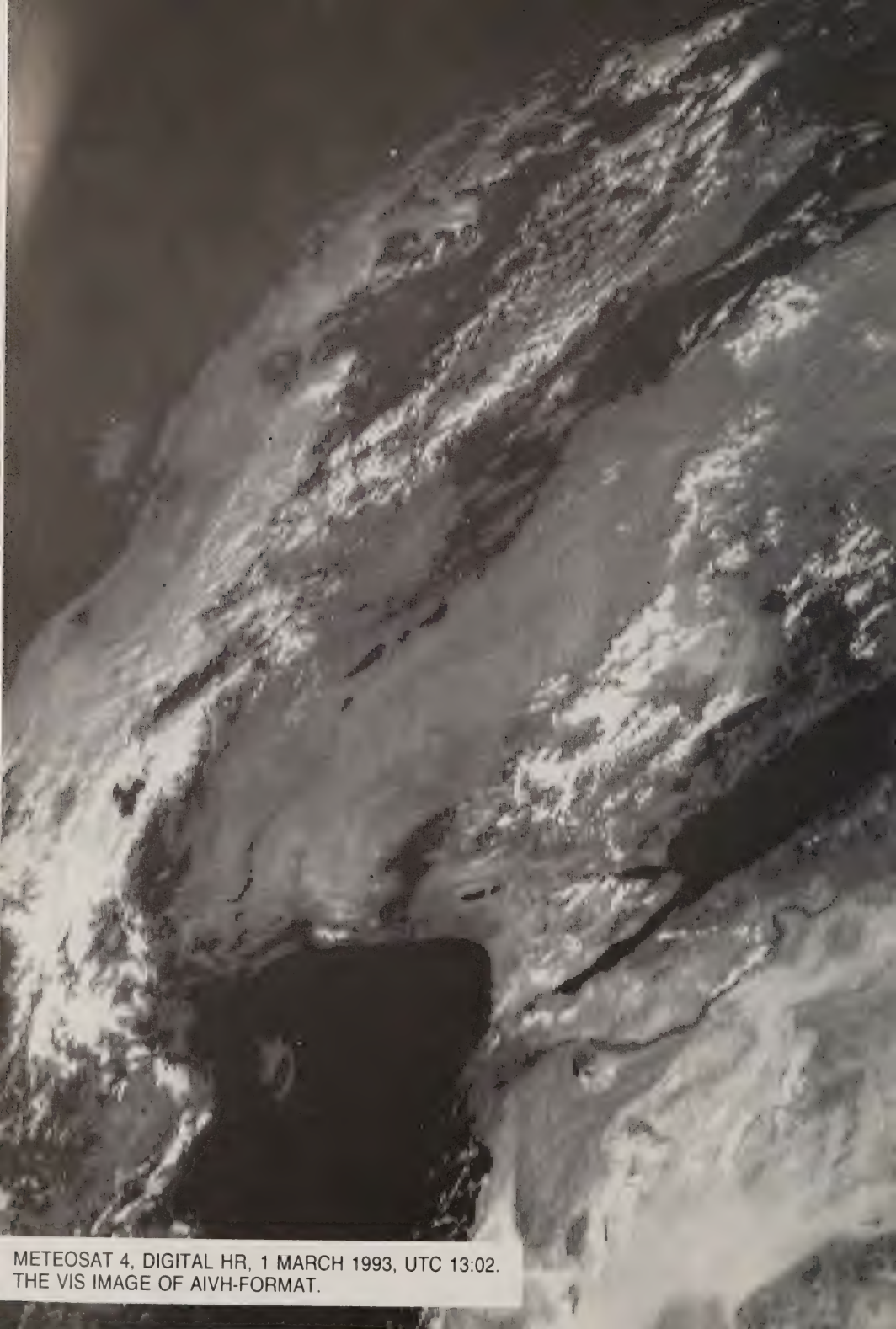


IMAGE WITH SLIP REALIGNED



FINAL IMAGE WITH NOISE REMOVED



METEOSAT 4, DIGITAL HR, 1 MARCH 1993, UTC 13:02.
THE VIS IMAGE OF AIVH-FORMAT.

NOAA 9 PERIOD 101.93 MINS FREQUENCY 137.62MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/06	08.06	19.38	17/07	09.26	19.17	19/08	09.05	18.56
15/06	07.53	19.25	18/07	09.13	19.04	20/08	08.52	18.43
16/06	09.22	19.12	19/07	09.00	18.51	21/08	08.39	18.30
17/06	09.09	18.59	20/07	08.47	18.38	22/08	08.26	19.59
18/06	08.56	18.46	21/07	08.35	18.25	23/08	08.13	19.46
19/06	08.43	18.33	22/07	08.22	19.54	24/08	09.42	19.33
20/06	08.30	18.20	23/07	08.09	19.41	25/08	09.29	19.20
21/06	08.17	19.49	24/07	09.37	19.28	26/08	09.16	19.07
22/06	08.04	19.36	25/07	09.24	19.15	27/08	09.03	18.54
23/06	09.33	19.23	26/07	09.11	19.02	28/08	08.50	18.41
24/06	09.20	19.10	27/07	08.58	18.49	29/08	08.37	20.10
25/06	09.07	18.57	28/07	08.45	18.36	30/08	08.24	19.57
26/06	08.54	18.44	29/07	08.32	20.05	31/08	08.11	19.44
27/06	08.41	18.31	30/07	08.19	19.52	01/09	09.40	19.31
28/06	08.28	20.00	31/07	08.06	19.39	02/09	09.27	19.18
29/06	08.15	19.47	01/08	09.35	19.26	03/09	09.14	19.05
30/06	08.02	19.34	02/08	09.22	19.13	04/09	09.01	18.52
01/07	09.31	19.21	03/08	09.09	19.00	05/09	08.48	18.39
02/07	09.18	19.08	04/08	08.56	18.47	06/09	08.35	20.08
03/07	09.05	18.55	05/08	08.43	18.34	07/09	08.22	19.54
04/07	08.52	18.42	06/08	08.30	20.03	08/09	08.09	19.41
05/07	08.39	18.29	07/08	08.17	19.50	09/09	09.38	19.28
06/07	08.26	19.58	08/08	08.04	19.37	10/09	09.25	19.15
07/07	08.13	19.45	09/08	09.33	19.24	11/09	09.12	19.02
08/07	08.00	19.32	10/08	09.20	19.11	12/09	08.59	18.49
09/07	09.29	19.19	11/08	09.07	18.58	13/09	08.46	18.36
10/07	09.16	19.06	12/08	08.54	18.45	14/09	08.33	20.05
11/07	09.03	18.53	13/08	08.41	18.32	15/09	08.20	19.52
12/07	08.50	18.40	14/08	08.28	20.01	16/09	08.07	19.39
13/07	08.37	18.27	15/08	08.15	19.48	17/09	09.35	19.26
14/07	08.24	19.56	16/08	08.02	19.35	18/09	09.22	19.13
15/07	08.11	19.43	17/08	09.31	19.22	19/09	09.09	19.00
16/07	07.58	19.30	18/08	09.18	19.09	20/09	08.56	18.47

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

NOAA 10 PERIOD 101.12 MINS FREQUENCY 137.50MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/06	06.43	18.10	17/07	06.51	18.18	19/08	06.58	16.45
15/06	06.19	17.46	18/07	06.27	17.54	20/08	06.34	18.01
16/06	07.36	17.22	19/07	07.44	17.30	21/08	06.10	17.37
17/06	07.12	16.58	20/07	07.19	17.05	22/08	07.27	17.13
18/06	06.47	18.15	21/07	06.55	16.41	23/08	07.02	16.48
19/06	06.23	17.50	22/07	06.31	17.58	24/08	06.38	18.05
20/06	07.40	17.26	23/07	06.06	17.34	25/08	06.14	17.41
21/06	07.16	17.02	24/07	07.23	17.09	26/08	07.31	17.17
22/06	06.51	18.19	25/07	06.59	16.45	27/08	07.06	16.52
23/06	06.27	17.54	26/07	06.35	18.02	28/08	06.42	18.09
24/06	07.44	17.30	27/07	06.10	17.38	29/08	06.18	17.45
25/06	07.20	17.06	28/07	07.27	17.13	30/08	07.35	17.21
26/06	06.55	16.41	29/07	07.03	16.49	31/08	07.10	16.56
27/06	06.31	17.58	30/07	06.39	18.06	01/09	06.46	18.13
28/06	06.07	17.34	31/07	06.14	17.42	02/09	06.22	17.49
29/06	07.24	17.10	01/08	07.31	17.17	03/09	07.38	17.25
30/06	06.59	16.45	02/08	07.07	16.53	04/09	07.14	17.00
01/07	06.35	18.02	03/08	06.43	18.10	05/09	06.50	16.36
02/07	06.11	17.38	04/08	06.18	17.46	06/09	06.26	17.53
03/07	07.28	17.14	05/08	07.35	17.21	07/09	07.42	17.28
04/07	07.03	16.49	06/08	07.11	16.57	08/09	07.18	17.04
05/07	06.39	18.06	07/08	06.47	18.14	09/09	06.54	16.40
06/07	06.15	17.42	08/08	06.22	17.50	10/09	06.29	17.57
07/07	07.32	17.18	09/08	07.39	17.25	11/09	06.05	17.32
08/07	07.07	16.53	10/08	07.15	17.01	12/09	07.22	17.08
09/07	06.43	18.10	11/08	06.51	18.18	13/09	06.58	16.44
10/07	06.19	17.46	12/08	06.26	17.54	14/09	06.33	18.01
11/07	07.36	17.22	13/08	07.43	17.29	15/09	06.09	17.36
12/07	07.11	16.57	14/08	07.19	17.05	16/09	07.26	17.12
13/07	06.47	18.14	15/08	06.55	16.41	17/09	07.02	16.48
14/07	06.23	17.50	16/08	06.30	17.57	18/09	06.37	18.05
15/07	07.40	17.26	17/08	06.06	17.33	19/09	06.13	17.40
16/07	07.15	17.01	18/08	07.23	17.09	20/09	07.30	17.16

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

NOAA 11 PERIOD 101.97 MINS FREQUENCY 137.62MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/06	05.09	15.00	17/07	05.09	15.00	19/08	05.08	14.59
15/06	04.56	14.47	18/07	04.56	14.47	20/08	04.56	14.47
16/06	04.44	14.35	19/07	04.44	14.35	21/08	04.43	14.34
17/06	04.32	14.23	20/07	04.32	14.23	22/08	04.31	14.22
18/06	04.19	14.10	21/07	04.19	14.10	23/08	04.19	14.10
19/06	04.07	15.40	22/07	04.07	15.40	24/08	04.06	15.39
20/06	03.55	15.28	23/07	03.55	15.28	25/08	03.54	15.27
21/06	03.42	15.15	24/07	03.42	15.15	26/08	05.23	15.14
22/06	05.12	15.03	25/07	05.12	15.03	27/08	05.11	15.02
23/06	05.00	14.51	26/07	04.59	14.50	28/08	04.59	14.50
24/06	04.47	14.38	27/07	04.47	14.38	29/08	04.46	14.37
25/06	04.35	14.26	28/07	04.35	14.26	30/08	04.34	14.25
26/06	04.23	14.14	29/07	04.22	14.13	31/08	04.21	14.13
27/06	04.10	15.43	30/07	04.10	15.43	01/09	04.09	15.42
28/06	03.58	15.31	31/07	03.58	15.31	02/09	03.57	15.30
29/06	03.45	15.18	01/08	03.45	15.18	03/09	05.26	15.17
30/06	05.15	15.06	02/08	05.15	15.06	04/09	05.14	15.05
01/07	05.03	14.54	03/08	05.02	14.53	05/09	05.01	14.53
02/07	04.50	14.41	04/08	04.50	14.41	06/09	04.49	14.40
03/07	04.38	14.29	05/08	04.38	14.29	07/09	04.37	14.28
04/07	04.26	14.17	06/08	04.25	14.16	08/09	04.24	14.15
05/07	04.13	14.04	07/08	04.13	15.46	09/09	04.12	15.45
06/07	04.01	15.34	08/08	04.00	15.33	10/09	04.00	15.33
07/07	03.49	15.22	09/08	03.48	15.21	11/09	03.47	15.20
08/07	05.18	15.09	10/08	05.18	15.09	12/09	05.17	15.08
09/07	05.06	14.57	11/08	05.05	14.56	13/09	05.04	14.55
10/07	04.53	14.44	12/08	04.53	14.44	14/09	04.52	14.43
11/07	04.41	14.32	13/08	04.41	14.32	15/09	04.39	14.31
12/07	04.29	14.20	14/08	04.28	14.19	16/09	04.27	14.18
13/07	04.16	14.07	15/08	04.16	15.49	17/09	04.15	15.48
14/07	04.04	15.37	16/08	04.03	15.36	18/09	04.02	15.35
15/07	03.52	15.25	17/08	03.51	15.24	19/09	03.50	15.23
16/07	03.39	15.12	18/08	05.21	15.12	20/09	05.19	15.10

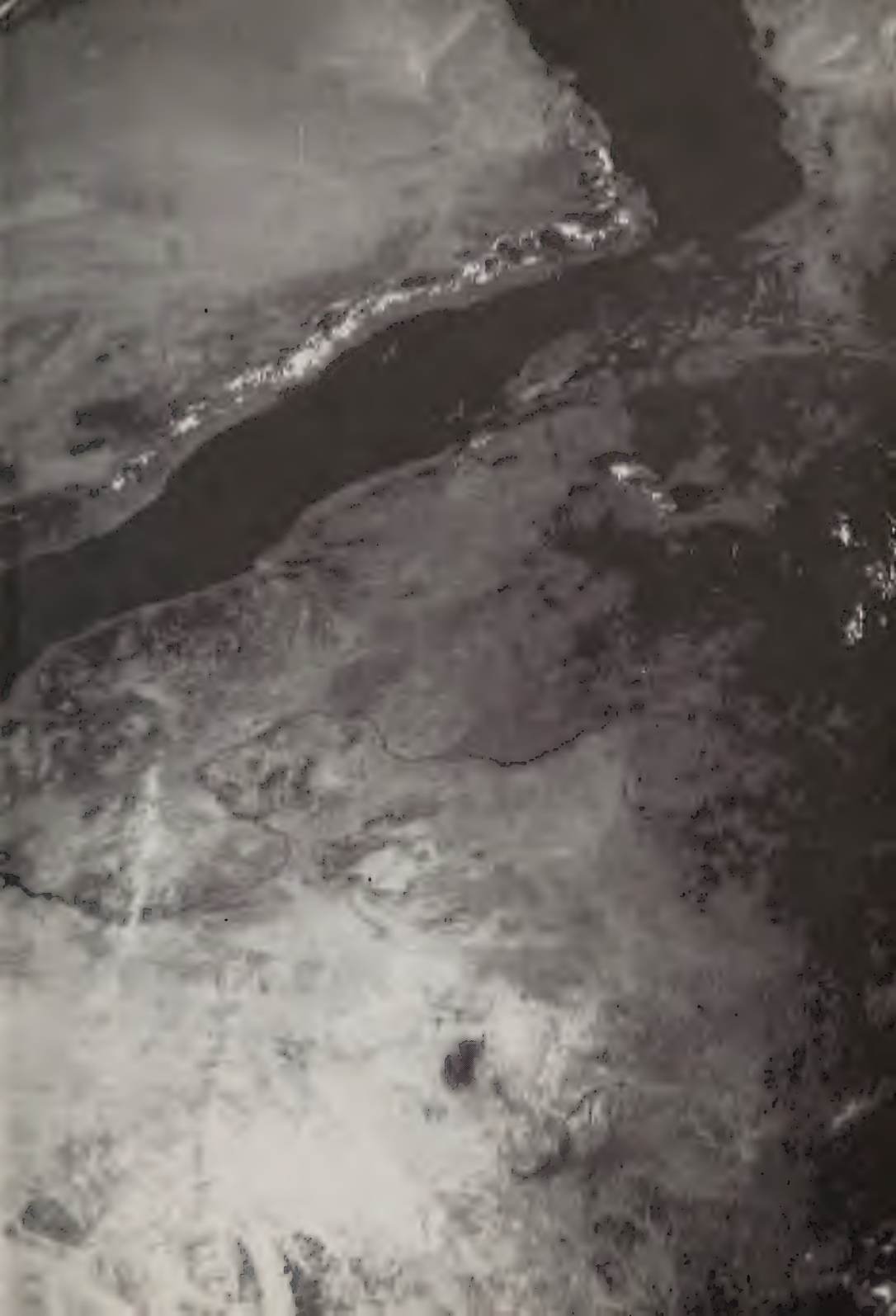
MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND

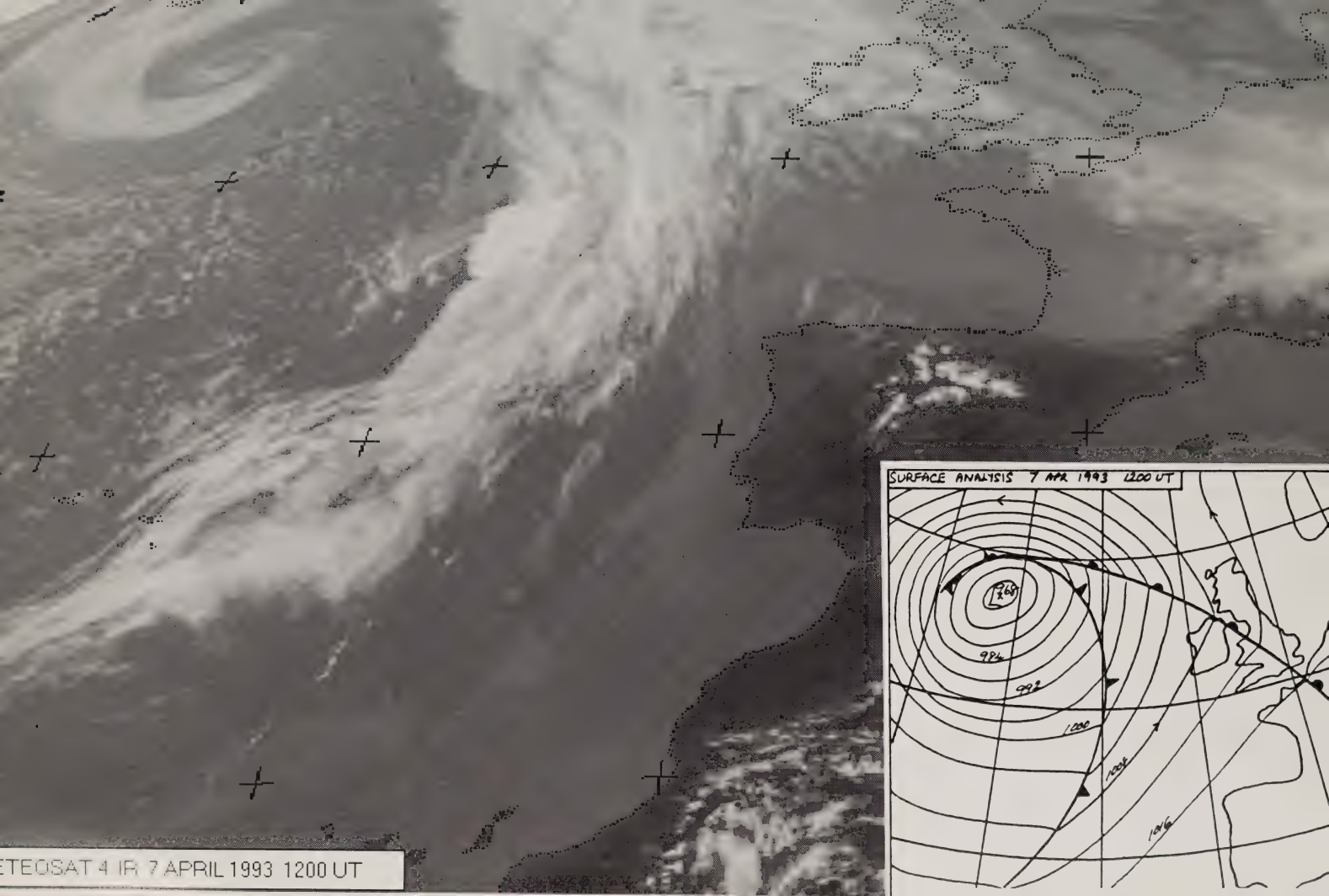
NOAA 12 PERIOD 101.30 MINS FREQUENCY 137.50MHz

TIME OF ACQUISITION OF SIGNAL - 52.5 DEG NORTH 0 DEG EAST

14/06	07.16	18.44	17/07	08.48	18.35	19/08	08.39	18.26
15/06	08.35	18.23	18/07	08.26	18.14	20/08	08.17	18.04
16/06	08.14	18.01	19/07	08.05	17.52	21/08	07.55	17.42
17/06	07.52	19.20	20/07	07.43	19.11	22/08	07.33	19.02
18/06	07.30	18.59	21/07	07.21	18.50	23/08	07.11	18.40
19/06	08.50	18.37	22/07	08.41	18.28	24/08	08.31	18.18
20/06	08.28	18.15	23/07	08.19	18.06	25/08	08.09	17.56
21/06	08.06	17.53	24/07	07.57	17.44	26/08	07.47	19.16
22/06	07.45	19.13	25/07	07.35	19.04	27/08	07.26	18.54
23/06	07.23	18.51	26/07	07.14	18.42	28/08	08.45	18.32
24/06	08.42	18.29	27/07	08.33	18.20	29/08	08.23	18.10
25/06	08.21	18.08	28/07	08.11	17.58	30/08	08.01	17.49
26/06	07.59	17.46	29/07	07.50	19.18	31/08	07.40	19.08
27/06	07.37	19.05	30/07	07.28	18.56	01/09	07.18	18.46
28/06	07.15	18.44	31/07	08.47	18.34	02/09	08.37	18.25
29/06	08.35	18.22	01/08	08.26	18.13	03/09	08.16	18.03
30/06	08.13	18.00	02/08	08.04	17.51	04/09	07.54	17.41
01/07	07.51	19.20	03/08	07.42	19.10	05/09	07.32	19.00
02/07	07.30	18.58	04/08	07.20	18.49	06/09	07.10	18.39
03/07	08.49	18.36	05/08	08.40	18.27	07/09	08.30	18.17
04/07	08.27	18.14	06/08	08.18	18.05	08/09	08.08	17.55
05/07	08.06	17.53	07/08	07.56	17.43	09/09	07.46	19.15
06/07	07.44	19.12	08/08	07.34	19.03	10/09	07.24	18.53
07/07	07.22	18.50	09/08	07.13	18.41	11/09	08.44	18.31
08/07	08.42	18.29	10/08	08.32	18.19	12/09	08.22	18.09
09/07	08.20	18.07	11/08	08.10	17.57	13/09	08.00	17.47
10/07	07.58	17.45	12/08	07.49	19.17	14/09	07.38	19.07
11/07	07.36	19.05	13/08	07.27	18.55	15/09	07.17	18.45
12/07	07.14	18.43	14/08	08.46	18.33	16/09	08.36	18.23
13/07	08.34	18.21	15/08	08.24	18.12	17/09	08.14	18.01
14/07	08.12	17.59	16/08	08.03	17.50	18/09	07.52	17.40
15/07	07.50	19.19	17/08	07.41	19.09	19/09	07.31	18.59
16/07	07.29	18.57	18/08	07.19	18.48	20/09	07.09	18.37

MORNING PASSES ARE SOUTHBOUND EVENING PASSES ARE NORTHBOUND




SURFACE ANALYSIS 7 APR 1993 1200 UT
L 968
984
992
1000
1008
1016
ETEOSAT 4 IR 7 APRIL 1993 1200 UT

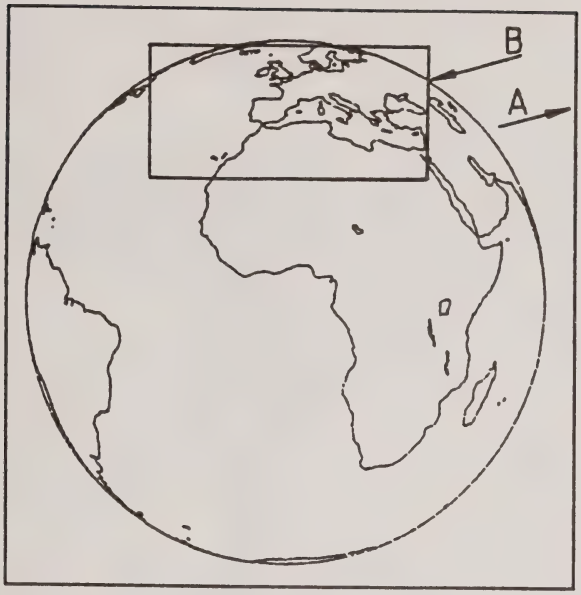


Fig.1
High-Resolution Formats A and B

Fig.2
High-Resolution Format X

Fig.3 - A Meteosat PDUS Receiving System
Block Diagram

Fig.4 - 10.7 MHz Amplifier and Bandpass Filter

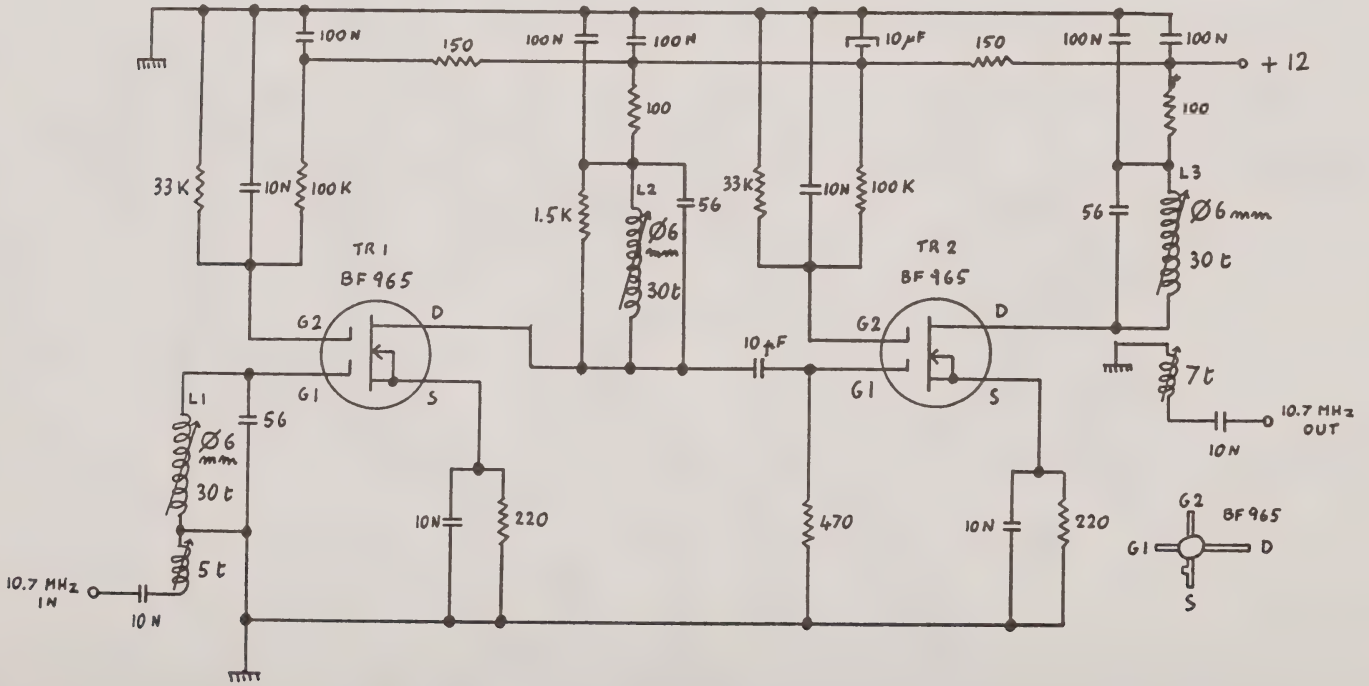


Fig.5 - Phase Demodulator

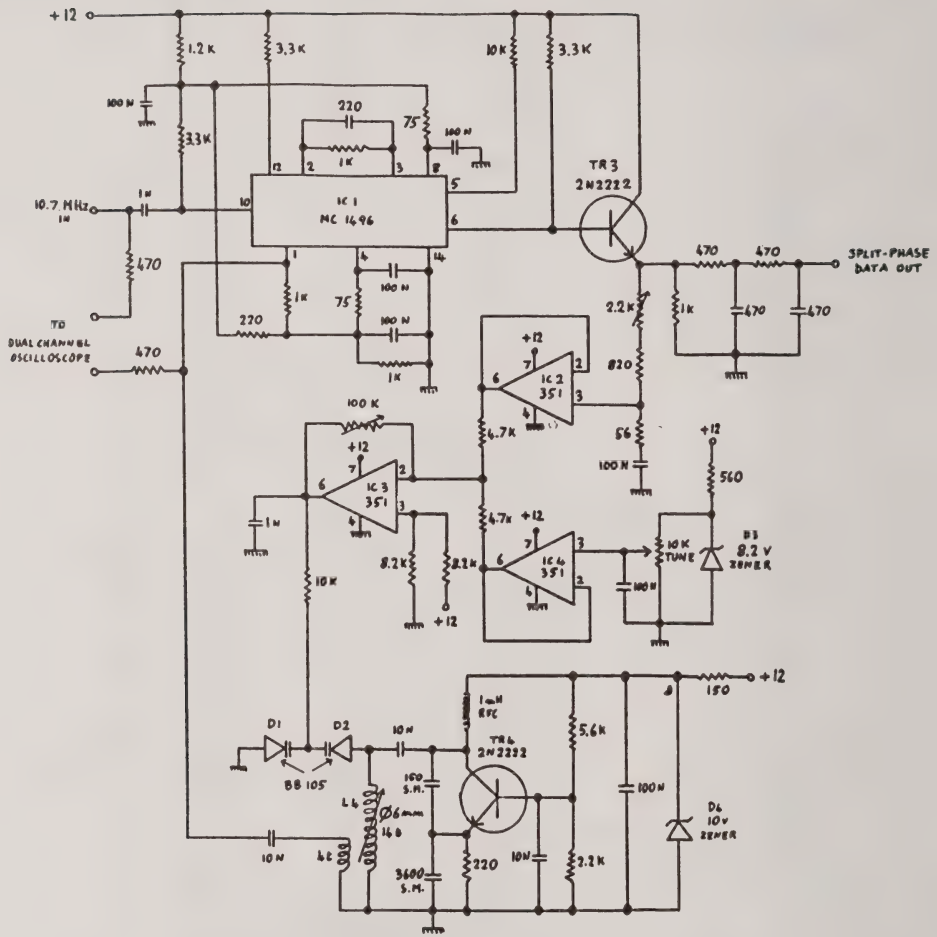


Fig.6 - Split-Phase Low to Nonreturn-to-Zero Decoder

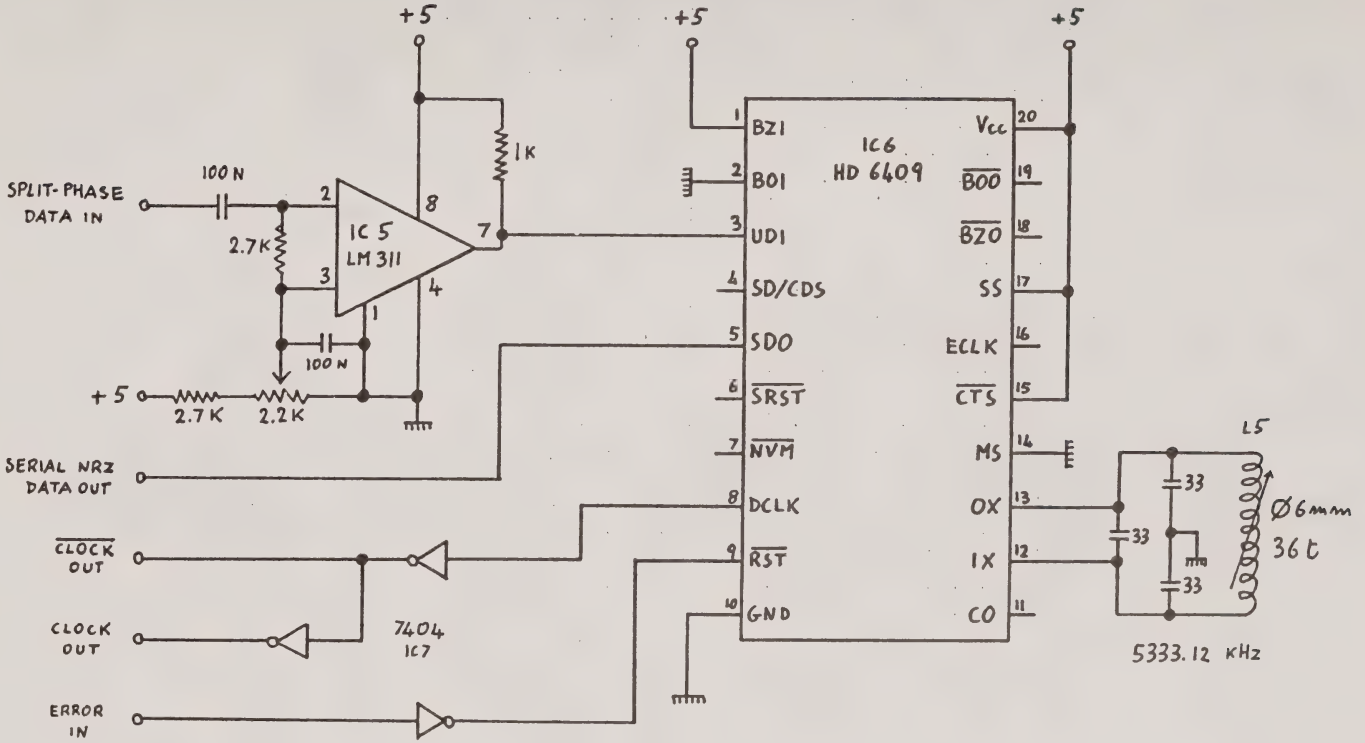
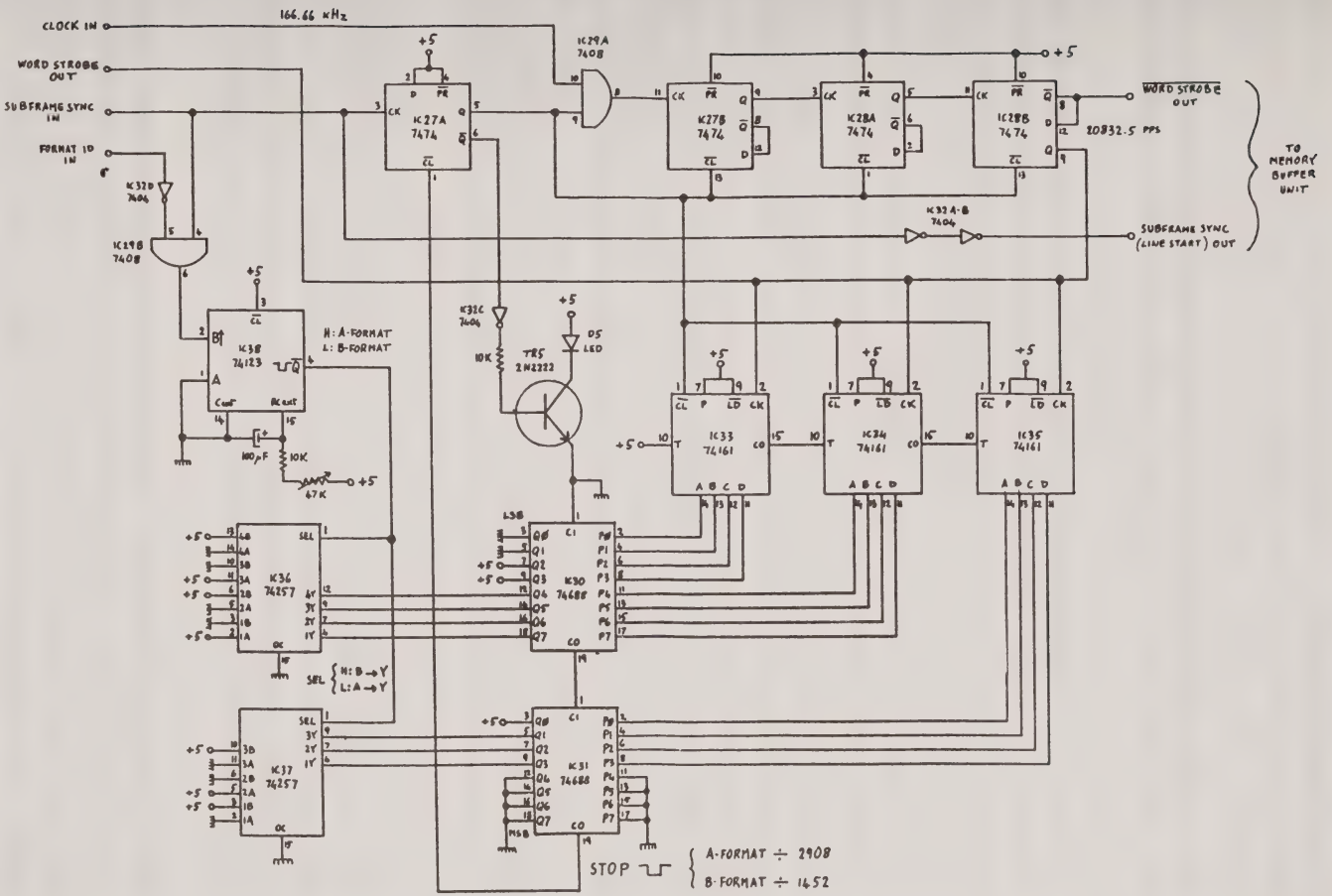


Fig. 7 - Serial-to-Parallel Converter and Sync Detector

Fig.8 - Word Strobe Detector



COMPOSITE IMAGERY IN CLOUD STUDIES

C.G.Roberts, *Halesowen Climate Station*

The advent of satellites had immediate benefits for meteorology and forecasting; the ability to "see" frontal systems and track their paths, leading to far greater accuracy in short-term prognosis.

Unfortunately, black and white imagery, good as it is, cannot yield the detail of cloud type which meteorologists would appreciate for their work. The colouring of images using a variety of methods often produces results which can be far from ideal. It is very difficult to prevent colour from "spilling over" to adjacent areas, based as it is on pixel values.

However, false colouring, using the visible and infra-red images combined, can offer marked advantages, in that land, sea and cloud can be more clearly defined. By careful manipulation it is even possible to highlight differing cloud types since these are at different heights, and hence, different temperatures.

The imaging process for accomplishing this is referred to by a variety of terms, the most frequently used being "Multi-Spectral" or "Composite". In essence this work entails committing one of the two satellite channels transmitted to the blue gun of the monitor, whilst the other is sent to the green. A combined "Processed" image is then sent to the red gun, and can be viewed, with suitable software, in 24-bit colour. The colour print (reproduced on the Front Cover of this issue) well illustrates such an image which is of Europe on May 23, 1992, taken from the early afternoon NOAA pass. But first, the methods involved in the acquisition and processing of the images.

In early computer work at the Halesowen Climate Station; both satellite and data processing was done on an Archimedes 310M. To comply with MET Office requirements for data returns in "CAWS" format on disc, for direct input onto the mainframe computer, work was transferred to a P.C., an Austin 486 33VLI; a B/Ae Dartcom Rasterex Satellite System was installed at the same time.

Signal capture at Halesowen is achieved with a Dartcom System II Receiver, using either the 90cm dish at ground level, or turnstile antenna some 40ft higher on the roof. Signal processing is with the B/Ae Dartcom Rasterex based PC system v.3.52, which is totally computer controlled and yields quite superb images. The system is particularly well suited to Met. work and is the standard equipment at many Met. Office outstations, as it can be left

unattended; the computer taking full control of receiver switching, image capture and filing. The end results are 640kb binary files of the IR and visible sections of either polar orbiters or Geostationary transmissions. With Meteosat, careful choice of slot enables "nearly adjacent time frames" of CTOT, DTOT, C2D and D2 to be taken. These are saved on 720kb DOS disks which can be read by the Acorn Archimedes using Multi-FS.

Individuals and education establishments using the Archimedes as the main computer can achieve similar results by taking images from the Spacetech Desk_WX software package and their internal podule.

At Halesowen the composite image processing is done on the Archimedes, an A310M with Riscos 3, the PCATS Graphics Enhancer, and PDSVIEW, an excellent piece of software from Spacetech, which enables full 24-bit colour on the A310 in Mode 126.

Here the IR image from the Dartcom system is imported into PDSVIEW on the A310M and processed to expand the pixel values across the full 256 range. This is then sent to the blue gun. The visible image is similarly processed and sent to the green gun. Within the software the blue and green images are multiplied together to combine the IR and visible aspects of the initial scene scanned, and sent to the red gun. A final composite image is then obtained from the red gun in 24-bit colour.

Ground detail is enhanced by manipulation of the IR (blue) image; a binary process to increase the red part of the image. This is sent back to the red gun and the final image produced as seen in the illustration.

The composite image from PDSVIEW is saved as a TIFF file on a 720k DOS disk for re-importation into the Dartcom Software package, where it is loaded into RXIMAGE. This is a powerful inbuilt paint package utility which enables the final image to be "tidied-up" if necessary, titles to be added, cropping done, and printing out to be achieved. Almost all images are output to the H.P. Paintjet, but for the image illustrated here, printing was done, by Integrex, on their Colourcel.

The final image on screen is quite stunning. Printed copies are never quite so good. However, a great deal of information can be revealed which is not obvious on a B/W print. For instance, here we have a mass of stratus, or "HAAR" (low temperature, sea-hugging fog) in the North Sea and filtering into the river valleys of Eastern Scotland and North-East England. This is seen as a Yellowish-Green and it is quite easy to distinguish both the layering of, and

swirling within, this fog bank. Similarly, low cloud with approximately the same, if rather deeper, colouration can be found over parts of Europe in association with middle or higher level cloud.

Higher, colder, and generally rain-bearing cloud shows up Bright Blue. A frontal line of thundery cells can be seen right the way from the Straits of Dover, through Northern France and into Germany. A thunderstorm was in progress over the English Channel at the time. A further area of rain cloud (Blue) is seen approaching from the Bay of Biscay. Middle layer cloud, almost Cyan in colour, can be found to the West of Iceland. Sea is generally Navy Blue, with land either Brown or Greenish Brown. Haze often appears as a Bluish-purple.

These "Composite" or "Multi-Spectral" images are extremely useful for determining cloud type, and, although the colouring is "false", they do produce much more meaningful information than the simple B/W ones, or those obtained by pixel-level colouration.

METEOSAT INFO...

METEOSAT 4 remains the operational satellite at 0 degrees west and will do so for some time.

METEOSAT 5 remains at around 4 degrees west, and was switched on at the end of March and the end of April for tests, causing interference to some stations receiving METEOSAT 4. It still has problems, not completely resolved by software fixes, and further investigations follow.

METEOSAT 3 remains the operational satellite at 75 degrees west, and since moved gives a better coverage of North America while still monitoring the Atlantic. Due to its close position to the horizon, in the UK, it will not normally be possible to receive it's signals.

METEOSAT 6 is awaiting confirmation of a 2nd November 1993 launch, and will be placed in a storing orbit, being allowed to drift, over a year or two, into an operational orbit. This process saves on fuel, and consequently extends it's useful lifespan.

TRACK II - THE UPDATE

Mike Goodall

It is a year since my review of Track II, in RIG29, and now an update has appeared, with some useful additions, and hopefully a few bugs laid to rest. The main reason for the update is to remove the problems that many of the users had when their hard disk in their computers crashed. The original version was software protected and had to be 'installed' and 'uninstalled', so if you had more than two crashes, you used up your two lives with the software, and had to send back the disk to Timestep for a replacement. Although not a major hurdle; a little annoying. Another problem that users had was the incompatibility of TrackII with hard disk compression programs such as 'Stacker', etc. (although the original version of TrackII was never designed to run with these). The new version is compatible with the hard disk compression programs.

The new version of TrackII is not software protected, but supplied with a 'Dongle'. For those who think this is something like a Boy Scout's 'woggle'; a short explanation! A Dongle is a small plug/socket adapter box, about 2" square which plugs into your printer port on the back of your PC. The printer cable, in turn, plugs into the Dongle. As far as your printer is concerned it is invisible, and has no effect. However, the software interrogates the Dongle and only allows the program to run if it is present, and gets back the correct data from the Dongle. Once it has been installed you can forget about it. (However, if you have more than one Timestep product that uses a Dongle, you will have to install a printer cable switching box, or tell Timestep the old Dongle number when ordering).

The first thing you will notice about the program is the ability to have more than one group of six satellites to display. This apparently, was a direct result of my suggestion in the last review. You can program which satellites you want in each of the four blocks, from a single satellite, up to 6 satellites; and there are now 4 blocks, instantly loaded onto the screen by pressing f9, f10, f11, or f12. The selections are set up from the main menu, and can be quickly changed at will. To start to customise the blocks for your own use... Press f9 to go to the first block, select 'Satellite' menu and then click on 'Clear All'. Then proceed to add 'New Satellite's to your choice; and when you have the block looking the way you want it, click on 'Save Block'. Click on 'Block 1'; this block is then saved to a separate file that can be altered whenever you want to change the block. Press f10 to go to the next block and repeat the sequence; saving it as 'Block 2' of course. Blocks 3 and 4 are programmed the same way. ALT/f9, ALT/f10, ALT/f11 and ALT/f12 will also save the blocks.

For example; you can have the Noaas on one block, the current Russian Mets on the next, and the other Polar Orbiters on another, etc. This avoids the confusing mess that is sometimes displayed when you have several satellite footprints on top of each other. Remember: when in fast mode (f4) the speed at which the satellites track across the screen will depend on how many satellites you have selected in the block. If one satellite only is selected it will track six times faster than if six satellites are selected. The speed of your machine will also have an effect of course. If you have a co-processor, this will speed up the whole operation considerably.

The system requirements for the new version are...
286 or better IBM type PC/AT compatible
Hard Disk drive
Mouse (recommended, but not essential)
VGA Graphics capability
Co-processor (recommended, but not essential)
MS DOS 3.3 or higher

A few more additions to the original program ...
Alt/S saves the screen display to a ColoRix .SCF (640x480x16) file, which can be viewed via VPIC, etc.
Alt/P directs the screen display to the Laserjet Printer to produce a reasonable dithered print.
Alt/X saves the screen display to a .PCX file that can be viewed via Windows, etc.

For those not familiar with 'Alt' commands; hold down the 'Alt' button and press the other key.
'Spacebar' freezes motion when in the Fast Forward mode (f4). Another press enables it to continue.

You can also select 'Next Pass' on the Table menu, which displays the data of the next pass of every satellite.

The price of the new package is £49.00 including the Dongle, P&P and VAT. For RIG members wishing to swap in their old version the price is £25.00, all in. (Don't forget to return your old disk to Timestep). The new package also includes lifetime warranty and support. Because of the problems mentioned above, the old version has now been withdrawn. Although there are only minimal changes and enhancements with the new version, I am sure that it will be more than welcome by those regular users who have had troubles with the older version.

WE ALL START SOMEWHERE...

Ben Ramsden

1. Summary

The author is a complete beginner in the weather satellite field and describes his experiences of setting up a basic polar orbiter receiving station with YU3UMV framestore.

2. Introduction

During the late 1980s I became aware of the existence of weather satellites and was fascinated by the idea of receiving and displaying satellite pictures of the earth's surface in ones own home. However, being a full time student at the time meant that I had little free time and a very small bank balance, in addition I could not imagine that my land-lord would be over keen with a large aerial or satellite dish being attached to his property! Never mind I decided, the reception and display of weather satellite images would be a project for the future.

Several years, a degree in electrical & electronic engineering, several landlords and a real job later I decided to start my quest for pictures from space. Great - I'll start next Saturday - but hang on, where do you start?

3. The beginning

I reached for my copy of the Maplin catalogue and looked at the details of their kits for the reception and display of weather satellite images. The first thing that struck me was the price - this was not going to be a cheap project. It seemed imperative that any hard earned cash that was invested in this project must be spent wisely - I made a resolution which has proven invaluable - to fully investigate everything before spending a penny on hardware. Although this frustrated the keen side of me that wanted to get down to the nitty-gritty of picture reception, I consoled myself with the notion that the investigation and learning side of the project would have to be just as interesting as the final result.

4. Where to get information

Maplin (0702 554161, catalogue £3 from W.H.Smith or by post. Maplin also has shops in large cities around the UK). They sell a kit in several parts for the reception and display of weather satellites. Their catalogue describes the kits and project guides 18, 20, 23 & 24 detail construction. Most information is relevant to the kits but there is pitifully little on what you will/may pick up, when to expect it, what it should look like, what it means, etc... Don't bother reading any Maplin literature unless you are interested in the kits.

Cirkit (0992 441306), £2 catalogue by post or "from large newsagents" although I defy anyone to find a copy in a shop!). They sell a kit in several parts and there are a few lines describing these in their catalogue. As with Maplin, don't bother reading the Cirkit catalogue for general weather satellite information, unless you are interested in their kits.

Short Wave Magazine (0202 659910 £1.75p.m. or £21p.a. subscription monthly magazine containing Lawrence Harris' 2 page "Info in Orbit" column. Can be found in large newsagents after around 26th of month). This is very useful to the beginner once they know the basics. Some basic information about weather satellites (eg: Kepler what? NOAA who? etc.) is useful before reading "info in orbit". The author clearly understands his subject and is good at balancing information for the beginner and experienced alike. The latest weather satellite news is reported and correspondents' problems and queries are discussed. Although Short Wave Magazine is a radio enthusiasts magazine, the "info in orbit" column usually manages to make necessary technical information understandable.

For a couple of years now Lawrence Harris has been threatening to write a book about weather satellites, keep a look out, based on his knowledge demonstrated in Short Wave Magazine it should be good.

The Weather Satellite Handbook (Dr. Ralph E. Taggart, The American Radio Relay League, $20/£14.50, available from Short Wave Magazine Book service 0202 659930 and weather satellite equipment dealers). A very comprehensive guide to the weather satellite scene but it is biased towards the technically minded. Although American, weather satellites all speak the same "whistle/clip/clop" sound so the foreign nature of the book doesn't matter, except beware of the instructions about how to build your own display system - it is designed to work with American Standard TV sets and hence requires some expert changes to work with UK TVs & monitors.

Weather Satellite Reception (Chris Hornby, Spacetech, 21 West Wools, Portland, Dorset, DT5 2EA, 0305 822753, costs a few quid). Don't be put off by the amateurish spirally bound exterior which hides a wealth of information. It has been written by a nice man from Spacetech who realised the lack of decent reference material about weather satellites.

Non-technical people rejoice - the book has been written with both beginners and the more experienced in mind. The more technical & complex text is marked so that mere mortals can omit these parts and yet still get a good grounding in the basics of the subject. First published in 1986 and revised

several times since, I understand that it may be revised again soon when he can find the time.

And don't forget...
"The Remote Imaging Group" (who?) which evidently specialises in the weather satellite field! I have purchased all of the available back issues. If you are selective about what you read, RIG journal back issues are a mine of information. I have never been so knowledgeable about farming in East Anglia, sorry I mean weather satellite reception, as I am now.

Remember... you can afford to spend an awful lot on background reading material before it starts to compare with the cost of even the most basic of weather satellite reception hardware, so I would recommend that you read all that you can before spending a penny. Learn from other people's problems and mistakes!

5. What to start with?
I started by deciding what I wanted to achieve. I wanted the top of the range colour system that would display the minutest detail of land formations and cloud cover possible, or did I? Read about peoples' problems. Heard about interference? aerial problems? missing phasing bars? Yes it's all gobbledygook, but it does indicate that weather satellite systems are not as easy to set up and run as a new video recorder for example. And if you can't make your brand spanking new system work properly there usually isn't a "man who can" just down the street. Weather satellite reception is fairly straightforward, but I would suggest taking one step at a time, and match your reception & display equipment to your experience.

OK, so what did I settle on? I wanted the cheapest, most basic system that still produced "good" pictures.

5.1 Polar vs. Geostationary?
Polar Orbiters (NOAAs & Meteors) are cheaper to receive than Geostationary (Meteosats) because you only need a simple (£20) aerial compared with the dish & downconverter (£200?) for Meteosat. The penalty is that picture quality may be degraded by local buildings and interference.

5.2 The Receiver
Don't skimp here, get one with a reputation for good interference rejection. Even if you don't have interference problems now, all the signs are that the problem will increase over the next few years as more and more local paging services come on stream.

A receiver that "scans" i.e. changes frequency until it finds a signal is almost essential. One with a tone detector is even better since it guarantees that it only stops scanning when it detects a satellite and not simply some interference. Most receivers also contain a switch to operate an external tape recorder. A signal strength meter, although not essential is very useful, particularly when you are first setting up the system. Without one, you have little feeling for the effectiveness of the aerial. In my experience, aerials are far more difficult to wire and locate than any book suggests. Without a good signal strength it is impossible to get a good picture, however good the display system so spend time on the aerial. The only way to monitor your aerial performance is via a signal strength meter, so I would strongly recommend one.

5.3 The Display system

I have no computer so systems based on these were out due to their price. I have never heard anyone report a working Maplin system that they were satisfied with so I decided to reject them too. One machine stood out above all others for me was the rather strangely named "YU3UMV" framestore which are often found for sale in the second-hand columns of the RIG journal and Short Wave Magazine. It was one of these that I eventually purchased.

My advice about buying a system is straight forward - make sure that you get it fully demonstrated before buying, and make sure that you are happy with the results that it produces and how to operate it. I have had no problems with my frame store and am thrilled by the results, but I am the first to admit that twiddling many knobs and pressing several buttons at the start of every picture isn't everyone's cup of tea. Framestores are relatively cheap but complex to operate, whereas computerised systems are more expensive but more straight forward to operate. Computers have the added advantage of being able to enhance the image after reception, store it on disk and print it out. You pays your money and you makes your choice! As computer prices continue to fall I have no doubt that the framestore will become a redundant museum piece. That time is not yet here.

6. Setting Up

This is where my head-aches began! I purchased a turnstile VHF cross-dipole antenna (techno-speak for a bog standard polar orbiter aerial). I wired it exactly as the instructions, carefully measuring the length of the "phasing harness" (the little bit of cable that joins one part of the aerial to the other) and making sure that I got my "polarisation" correct (the order of connection of the two parts of the aerial). I had read that aerials often needed adjustment after installation so I opted for initial installation in the easily accessible loft rather

than straight onto the roof (little did I know how often I would need to adjust it before getting it right!).

I can still remember the sense of elation when I received the first picture - the coast of Scandinavia. Unfortunately over the next week all I seemed able to get was a whole series of pictures of the coast of Scandinavia. Where were the British Isles, the rest of Europe, Africa, Iceland, the Mediterranean?

At that time I didn't know when to expect the satellites, and when they did arrive how long you should be able to receive them for. I did feel that 5 minutes worth of Scandinavia every day was less than normal however!

To cut a long story short everything was wrong. The aerial supplier's instructions showed the aerial connected the wrong way round so it was incorrectly phased and they had also calculated the length of the phasing harness incorrectly! (I won't mention names Martelec!). I had mounted the aerial in a bad position in the loft and a very local tall building blocked out the signal from Cyprus to Gibraltar.

There is no easy way to sort out aerial problems, except be patient, check everything and alter one thing at a time in a logical sequence and compare results. Use only the directly overhead passes to check your aerial (listed in the centre pages of the RIG journal, times are in GMT [took me ages to work that one out!] and should last up to about 15 minutes). There are far more passes than are listed in the RIG journal, these are further East of West and hence lower over the horizon. It is usual to get poorer results from these, so don't try and test your aerial by them.

7. What Next?

Here in Halesowen, West Midlands (= Birmingham to most people who aren't local) I can receive NOAA pictures from north Africa a little south of Spain through to well north of Norway. Unfortunately a local tall building blocks pictures from the eastern Mediterranean up to mid Germany. The Russian satellites, being higher, give a slightly greater coverage.

One day I aim to mount my aerial on the roof in the hope of improving coverage, but I'm not sure whether this will work. I can't imagine that a few tiles significantly reduce the signal, and I am reluctant to pay an aerial erector for the privilege of climbing all over my roof! When funds permit I shall invest in a dish and downconverter for receiving the Meteosat geostationary satellites. If anyone has a cheap secondhand one that they don't want then please let me know!

Finally, I have had a lot of fun and frustration setting up my weather satellite station and I still have a tremendous amount to learn. If anyone wants any help or advice then please feel free to give me a call on 021 422 0195, but bear in mind that RIG has experts able to give advice based on years of experience, and I would suggest that they are far more qualified than I. Happy reception!

FOR SALE...

Amiga 500 (Upgradeable to 1Meg) Plus Amigasat V.2.0 plus Commodore 1084S Monitor plus numerous games and word processing package £275.00 O.N.O Also Timestep Amiga 'Ground Station' £40 (Ideal for beginner).
Bob Howitt, 7 Badgers Close, Galleywood, CHELMSFORD. Essex.
Tel: 0245 346894

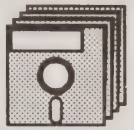
BBC-B Issue 7 with ROM/RAM Board with extra 16k RAM and Memory, SATPIC, DUMPOUT and P.D.RoM's, and 5 1/4" 40/80 Disc Drive. Timestep 3.0 Interface and RX together in professional steel case, RX has switched Crystals for both NOAA channels with LED's and spare Crystals for Meteor series and switched Clock.Interface has Tape I/P and spare Rx facilities. Gives good pictures in Mode I which can be transferred to 5 1/4" Disc. All documentation included. £300 exclusive of Carriage.
W. Lantishear. 57 St Georges Road, East Looe, Cornwall, PL13 IED
Telephone: Looe 262823.

YU3 UMV Framestore, boxed, all circuits and info supplied £150 inc. p&p
Adam White 10, Portland Rd., Galston, Ayrshire KA4 8ED Tel: 0563 820461

1. Phillips Metal cased composite video monitor, Type HCS 31 (Colour). As new. Excellent resolution £60
2. I.C.L. A3 size daisywheel printer. Perfect condition £20 / Offers.
3. Sharp MZ80A Computer as new. Any Offers?
Or exchange any/all of above for good dish & feedhorn etc., radio or sat. gear.
John Pearson, 'Blakeney', Ashburnham Close, Norton, Doncaster DN6 9HJ
Tel: 0302 700414

SHAREWARE CORNER

MIKE GOODALL



NEOPAINT This must be one of, if not the, best shareware program that edits, titles and converts GIF, TIF, and PCX format pictures. As well as all this it is a Paintbox type program. You can create your own graphics files, with freehand or with the various rectangles, circles and other shapes available. The whole program will work in a low resolution, right up to SVGA, 1024 x 768 x 256 colours. It is also a GUI (graphics user interface) program that can easily be used with the mouse or trackball. It does take a little longer than some other programs to load in a picture, but not excessively so. *(VPIC is surely the quickest one).* You can edit any of the 256 palette colours individually in very small steps, allowing you to create virtually any colour you can think of. There is also a good range of fonts for titling your pictures. There is very little that you cannot do with GIF, TIF and PCX files when using this program. There is also a screen-grabber program included for saving the contents of the screen direct to a PCX file, when running any other program. Not the cheapest to register, at £48.83 inc. P&P, from their UK agent, but so far advanced it must be well worth the money. If you play with GIF, TIF or PCX files you must give this one a try. *Available on Disk 99C*

GWS for WINDOWS USERS Graphics Workshop has been around for a few years now, and with many different versions. This one which works in Windows 3.0 or 3.1, and is a leap ahead of the rest. It has a good menu and file display page, and is relatively easy to use. The file formats used are GEM/IMG, PCX, TIF (all in 24 bit resolution) and GIF (in 8 bit resolution), as well as some less-known ones. You can even have thumbnail sketches of all your working files on the screen at once. Contrast and brightness controls, as well as overall three colour palette control is available. Worth a try if you use Windows. Can also be registered with a UK agent. *Available on Disk 99C*

DAT2PA2 A small program by one of our members, Guy Martin, which converts Timestep .DAT files into .PA2 files, used in PCAnimate. Useful for making animated images of LY and LR formats etc. *Available on Disk 99*

CUT-NOAA A small program by Les Hamilton for trimming large .NOA files to fit on a 1.4mb disk. Runs in GWBASIC and QBASIC.*Available on Disk 99A*

GIFDESK v.4 Another Gif viewing program. *Available on Disk 99A*

THE GIF PICTURE LIBRARY

MIKE GOODALL

The following are available at present:

Disk 1 UK Noaa: in colour (x5)
Disk 2 UK Noaa: most in colour (x5)
Disk 3 Americas: various (x9)
Disk 4 Americas: various (x8)
Disk 5 Americas: various (x7)
Disk 6 Space: Spaceman, Launch, Mars, Venus, Saturn, Earth (x7)
Disk 7 Earth: various HRPT, plus GMS4 (x8)
Disk 8 Russian Meteor: Various (x5)
Disk 9 Various (x9)
Disk 10 Russian Meteor/Landsat: USA (x4)
Disk 11 AusGMS and Noaas (x4)
Disk 12 Mets and Noaas (x4)
Disk 13 HRPT: Italy and Greece by Marciano Righini (x6)
Disk 14 SW Pacific (x5)
Disk 15 HRPT (Peter Hayes article, RIG29) (x7)
Disk 16 APT, various (x3)
Disk 17 FengYun and Okean (x4)
Disk 18 HRPT: various by Marciano Righini (x9)
Disk 19 HRPT: various by Marciano Righini (x9)
Disk 20 HRPT: Set of 5 channel HRPT by Peter Hayes + Greenland (x6)
Disk 21 HRPT: various by Peter Hayes and Marciano Righini (x7)
Disk 22 HRPT: various by Tom Loebl (x5)
Disk 23 Space: Shuttle + Mars (x3)
Disk 24 APT of Arabia + PDUS Globe (x3)
Disk 25 PDUS: various by James Brown (x4)
Disk 26 Russ. Mets: by Ulf Jander, converted from Amiga format (x14)
Disk 27 Russ. Mets + Meteosat: Ulf Jander, converted Amiga format (x12)
Disk 28 Okean: by Les Hamilton, converted from Archimedes format (x9)
Disk 29 HRPT: converted from 24 bit images to 256 colours (x5)
Disk 30 Russian Mets: various (x7)
Disk 31 Australia: FY1b, Met, Noaa, by Michael Delahunty (x3)
Disk 32 Okean images by Les Hamilton (x6)

SHAREWARE PROGRAMS... Viewing/tracking progs. etc. (zipped) *PC Only!*

Disk 99	VPIC v.5.0 (viewing program, GIF, RIX, PCX, etc.) IMAGE PROCESS v.1.0 (GIF editing program) PCTRACK v.1.1 (Satellite tracking program, simple to use) GRAPHICS WORKSHOP v.6.0 (viewing/conv. for GIF, etc.) NOATIF v.2.0 (converts .DAT .NOA and Raw data files to .TIF) TRAK275 (satellite tracking program) DAT2PA2 (DAT to PA2 conversion program)
Disk 99A	PCTRACK v.2.1 (latest version, but more complicated to use) EDSAT v.1.6 (program for manipulating NASA 2-line files) ELEMENT MANAGER v.1.8 (management for 2-line and Amsat) VGA CAPTURE v.8.0 (resident screen capture program) COMPUSHOW v.8.41A (self-sizing viewing program) CUT-NOAA (a trimming program for large .NOA files) GIFDESK v.4 (a GIF viewing program) DOWN (Autodown & Prodown for ProsatII control)
Disk 99B	WINGIF (viewing program for GIF via Windows3 & 3.1) PAINTSHOP (another viewing program - Windows3 & 3.1) GEOCLOCK (Graphical map showing daylight areas, etc.) LEARNORBIT (Teaching program about orbits) WX v4.3 (Weather forecasting program) GIFDOT2 (GIF printer routine for dot matrix printers) JVFAX v5.1 (APT, FAX, WXFAX, etc. receiving program)
Disk 99C	NEOPAINT (GIF, TIFF, PXC Editor+ Paintbox program) GWSWIN11 (Windows version of the viewing/edit program)
Disk 99D	IMDISPLAY v.7.9 (GIF, etc. viewing/enhancing program)

You will need a viewing program to see the GIF files; VPIC is recommended for starters. It is supplied on Disk 99 in zipped form. PKUNZIP is included on all the Shareware disks. To use zipped versions of any of the programs... make a directory or subdirectory on your hard disk, where you want the program to reside (i.e. C:\VPIC) and unzip it into the directory as follows: **PKUNZIP <filename.zip> <Hard drive letter:\directory or subdirectory> (i.e. PKUNZIP VPIC50 C:\VPIC).**
Next read the Doc and Readme files to enable you to configure it to suit your video card and machine. Remember that some of the images may lack contrast and brightness. As most of the files supplied are in their original form, 256 levels, you will probably have to use the contrast and brightness keys on your viewing program to set the levels to your own preference. This can make a world of difference to the finished picture. Remember that if you resave the GIF file after altering the brightness and/or contrast you will always loose some of the original data. This is our main reason for supplying most of them in their original form. F3 is useful for finding file size.

HOW TO GET YOUR COPIES...

UK MEMBERS:

WHAT TO SEND...
UP TO 6 FORMATTED BLANK DISKS for PC format 1.4Mb or 1.2Mb only
for Archimedes format 800kb only
IN A RESEALABLE PACKAGE (or a package within a package)
A SELF ADDRESSED STICKY LABEL
STAMPS FOR THE RETURN POSTAGE
STAMPS OR COINS TO THE VALUE OF £2.00

Send to Mike Goodall, 2 Meadow Court, Littleport, Ely, Cambs. CB6 1JW.

Note: six disks stuffed into an ordinary plain or buff 9" x 4" envelope is woefully inadequate, as the package is unlikely to reach its destination intact. Small Jiffy bags are ideal, as are the special Disk Mailers available from your local computer store. Please, no small Postal Orders or Cheques as the bank takes most of it as charges!

OVERSEAS MEMBERS: As above, but return post is free. No donation reqd.

IMPORTANT... **ANYONE NOT COMPLYING WITH THE SIMPLE RULES OF THE GIF LIBRARY ABOVE (i.e. FORGETTING THEIR DONATION OR SENDING UNFORMATTED OR WRONGLY FORMATTED DISKS) WILL HAVE THEIR DISKS RETURNED BLANK.**
*** * * SORRY, BUT YOU HAVE BEEN WARNED! * * ***

Approximately 95% of the Members requesting disks comply with these simple rules, and due to the immense amount of time voluntarily given up to the Library, it is unfair of the remaining 5% to expect us to make special exceptions just for them.

Most Library disks have approx. 1.2Mb on them; the best format to send is 1.4Mb HD 3.5". 1.2Mb HD 5.25" are also acceptable.

Because of technical problems we can no longer copy files to 360kb and 720kb disks.

Only legal PC formats please. No drilled out 720kb or standard 720kb formatted to 1.44Mb; or 360kb to 1.2Mb, etc.

While we will take steps check master disks of GIF, Shareware and upgrades, RIG and it's officers will not be responsible for any virus damage caused.

THE ARCHIMEDES PICTURE LIBRARY

All the Picture Disks 1 to 30 are available for the Archimedes.
The Shareware Disks 99 to 99C are for PC users only!

How to obtain Archimedes Images...
The "Rules" for Archimedes owners are identical with those for PC owners. The only difference is the address to which to send requests, which is:-

LES HAMILTON, 8 DEESIDE PLACE, ABERDEEN, AB1 7PW

Please send only 800kb 'E' formatted DS/DD discs. Les uses an old Archimedes 310, and cannot handle the high format 1.6Mb discs used by the more modern machines. (All machines can format to 800kb on DS/DD discs)

Note Library disks Nos. 26, 27 and 30 will require two 800kb disks each to get all the converted files on.

If you have any !Framestore discs which you think could fit into this category, please feel free to send a copy, in the first instance, to:
Les Hamilton, 8 Deeside Place, Aberdeen, AB1 7PW, for evaluation.

UPGRADES...

PCwSatIII/PC-SAT3 Update disk. Dec. 1992, as mentioned in RIG24, incl. MET3-4. £3.00 handling charge, state disk size required.

PROSAT-II Update disk, Dec. 1992. All previous upgrades, plus Swap IR/VIS on Noaa, plus minor fixes. SNOISE included on disk.
£3.00 handling charge, state disk size required.

SNOISE, Signal to noise measuring program for Meteosat (for ProsatII system only) Send disk and return S.A.E.

TIMESTEP HRPT DEMO DISK, 1.4Mb. £3.00 handling charge.

OFS WEFAX DEMO DISK, 1.4Mb. £3.00 handling charge.

All upgrades available only from the Chairman.

THE SOVIET & CHINESE SCENE

PETER WAKELIN

METEOR 3-3 was switched on at the beginning of March and is still transmitting at the time of writing in late April. The usual iris aperture control problems cause marked banding on the visible images at times, but the infrared images continue to be of excellent quality.

Day length is increasing rapidly in northern latitudes, and although this spacecraft has now precessed through noon, it will remain well positioned for visible imagery for a few more weeks. By late May I would expect it to be replaced by MET 3-4.

Russell Eberst of Edinburgh, who has well over 100,000 visual observations of satellites to his credit, told me that METEOR 3-2 was varying considerably in brightness, whereas operational craft are normally of steady appearance. My own observations have confirmed that METEOR 3-2 is slowly rotating and is therefore unlikely to transmit any further imagery.

It is a long time since any signals were heard from any of the series 2 METEORS, OKEANS or FEN YUN, so I shall stick my neck out and say that these objects can safely be deleted from our predictions. That leaves just the latest three METEOR 3s, and the youngest of these, METEOR 3-5 will be two years old in August.

Fellow Kettering Group member Len Maxim, of Wellington, New Zealand, did wonder if a new METEOR was launched in January. He received a FANAS prediction bulletin from his former colleagues in the New Zealand Met Service which indicated an object in a very strange orbit. Although the predicted data were self-consistent, it soon became clear that it was a load of computer generated rubbish. A case of garbage in, garbage out!

The bulletins are issued from Moscow at 09.45 UT on alternate Tuesdays under the heading TBXN10 RUMS. They are disseminated over the World Meteorological Organisation's Global Telecommunication System, and also by RTTY on HF. They are the Russian equivalent of the TBUS prediction bulletins for the NOAA satellites, which are distributed similarly and, in addition, directly from GOES geostationary satellites, and by numerous EBBs.

KEPLER ELEMENTS

SIMON GOODALL

```
NOAA9              137.62MHz
1 15427U           93104.79647218 0.00000153                        3496
2 15427  99.1082 143.8652 0015048 350.8387   9.2501 14.13503134     14
NOAA10             137.50MHz
1 16969U           93104.51583161 0.00000171                        1896
2 16969  98.5191 121.4083 0013766 137.4107 222.8129 14.24791706     19
NOAA11             137.62MHz
1 19531U           93104.64649606 0.00000258                         946
2 19531  99.1259  79.2028 0010951 258.8235 101.1686 14.12861074     11
NOAA12             137.50MHz
1 21263U           93104.57069622 0.00000291                        5499
2 21263  98.6621 135.7810 0013879  41.7269 318.4961 14.22238967     17
MET3-2
1 19336U           93105.97030279 0.00000043                         353
2 19336  82.5358 265.9667 0016268 252.7356 107.1986 13.16957547     10
MET3-3             Last heard on 137.85MHz
1 20305U           93105.77380099 0.00000043                        7051
2 20305  82.5568 208.8940 0013527 268.2465  91.7111 13.16014810     14
MET3-4             Last heard on 137.30MHz
1 21232U           93102.39737699 0.00000043                        3548
2 21232  82.5471 114.2789 0016664 197.1226 162.9335 13.16822009     14
MET3-5
1 21655U           93092.44739430 0.00000043                        4121
2 21655  82.5505  68.0060 0012273 217.3027 142.7244 13.16817776     15
MET2-17
1 18820U           93105.90156241 0.00000123                        8651
2 18820  82.5382 248.4449 0016313 305.7252  54.2390 13.84679282     16
MET2-18
1 19851U           93099.56130213 0.00000080                        8002
2 19851  82.5226 129.6457 0015227   8.5487 351.5949 13.84330028     13
MET2-19            Last heard on 137.85MHz
1 20670U           93097.78377367 0.00000105                        5519
2 20670  82.5456 194.2908 0014701 293.6129  66.3487 13.84169097     18
MET2-20
1 20826U           93099.11350819 0.00000079                        5569
2 20826  82.5280 131.3553 0012599 179.5422 180.5739 13.83543668     13
FY1-2
1 20788U           91336.60222287 0.00000000                        2829
2 20788  98.9161   6.4973 0015529  88.3536 271.9405 14.01172198     18
```

(No excuses for listing all the Mets as we cannot tell which will be on!) The frequencies shown are the last frequencies the Russian satellites were heard on. NOAAs do not change frequency.

An explanation of the 2-line format for those who wish to convert or update their Amsat format files... In order, the blocks of data represent the following...

Line 1 : NORAD sat.number - Epoch date - Decay Rate - Checksum

Line 2 : NORAD sat.number - Inclination - Right Ascension - Eccentricity - Arg.of Perigee - Mean Anomaly - Mean Motion (8 decimal places) - Revolution No. - Checksum (1 digit)

(Note: The Eccentricity has a leading decimal place which is not shown but assumed.)

MEMBERS' LETTERS

[Any letters sent to the Editor, Make-up Editor or Committee are assumed to be available for publishing in the Newsletter, unless otherwise specified.]

Dear James,

I have been using a Timestep PDUS since the beginning of December. I bought it after reading James Brown's excellent article in Rig 30. The system was easy to set up and produced reliable noise free pictures from the start. At the pre January 1st price it was an amazing bargain. This letter is in no way a criticism of the system but a wish list of future software changes and some comments on the animation programmes missed out in James Brown's review.
I should say at this point that my interest is in predicting weather for my hobby of gliding, rather than a pure technical interest in satellite reception. My requirements may therefore be different from many Rig members.

My system spends most of its time animating the last 8 hours of infrared pictures to show the passage of weather fronts. It is occasionally stopped to get a visual picture as these show low cloud and fog which is easy to miss on an infrared picture.

There are two animation programmes supplied.

PDAFANIM uses the A format (full disk) images. It will animate the full disk at lower resolution or you can select an area to animate at full (5km) resolution. Typically with the UK centred on the screen, the frame will go from the Canary islands up to northern Scandinavia and from mid Atlantic to Italy. Each frame requires 307Kb of hard disk space and a similar amount of extended memory. For a typical 4 Meg memory computer, there will be 3Meg of extended memory available after the software is loaded and 9 frames of animation will be possible. To maximise the number of frames available, make sure you have disabled Your disk cache and load only an extended memory manager and a mouse driver. The software will let you animate any of the three channels but unlike the PDUS still frame software, it only stores a single channel on hard disk. If you change from say infrared to visual, the last few hours remain as infrared but the system starts to add visual pictures as they are received.

This is wish No 1.
Dear Mr Cawley, I would gladly accept using 600kb (or 900kb if you include the water vapour channel) of hard disk space per frame if it meant that when I change channel, all my existing frames change at once by re-loading from the hard disk. The other omission from this programme is the ability to load user pallets. playing with the PDUS still frame software shows how much the right pallet will enhance a picture.

Wish No 2.
Please can we load pallets produced in the still frame software. Its not that the existing pallets are bad. There is a very nice overlay that makes the sea blue and the land green and superimposes the cloud animation. There is also the standard black and white pallet which is a good compromise between being too light for infrared pictures and too dark for visible pictures. You can even make the highest clouds turn red by pressing F5. Its just that the pallet customizing available in the still frame software is so good that you want to have it for the animation.

The second animation programme, PDUSANIM, uses the B format European pictures. The manual says that you need 16Meg of memory to run this. There is no option to reduce the area stored and no option to set the number of frames although there is a menu option which shows how many frames your free memory will allow. The area of the B format pictures is from central Africa to the top of the disk and from mid Atlantic to the Nile delta. Each frame requires 1.03 Meg of hard disk space and a similar amount of memory. On my computer with 8 Meg of memory, the programme will store up to 7 frames and then crashes; presumable it is hard coded to store 15 frames, hence the requirement for 16Meg of memory. There is no option to set the channel. It's always infrared.

The question I ask myself about this programme is, why would anyone be tempted to go out and buy 16Meg of memory. The resolution is the same (5km) as PDAFANIM and the pictures are one every half hour as for the A format. The larger area of each frame is the only advantage but if you suddenly develop an interest in the weather in the Nile delta you can always move the window in PDAFANIM. The biggest advantage of the B format pictures is the 2.5Km resolution visual image broadcast on the half hour and PDUSANIM doesn't receive visual images.

Wish No 3.
Make PDUSANIM like my above description of the perfect PDAFANIM but working on the B format pictures. Allow restriction of the number of frames

and the area of each frame to bring the memory and hard disk requirements down to a reasonable level. Include channel selection so we can get animation of visible images. I know this last one may be tricky as you would be animating a sequence with alternate frames at 5Km and 2.5Km resolution but if anyone can do it, Mr Cawley can.

I'll finish by repeating that this isn't a complaint. The Timestep PDUS system is brilliant. It's just that I need all the help I can get to spot the good gliding days.

Basil Fairston Countesthorpe, Leics.

Dear Editor,

I thought I'd drop you a line regarding my weather activities:

I have had an interest in weather for a number of years but due to other hobbies and work have never really got around to getting the bits together, well, as I was at Sandown Park this year I took the plunge and purchased a Timestep receiver and turnstile VHF antenna plus a 44 element QLY for Meteosat at a future date.

The computer I use is a 486 @ 33MHz with CD Rom drive and masses of hard drive storage, I did not want to install any other cards inside the PC as I had various DMA/IRQ timing/tuning conflicts in the past and so the Comar package called GOES WEFAX software only was used (along with a 25 pin serial port plug containing a 741 i/c?), several well known people involved in remote imagery were contacted and advised me that I had gone about things the wrong way, and, that such software packages are a waste of time!

Well, after receiving HF Fax broadcasts and a few polar passes it was time to upgrade, in other words I was hooked, a few days later and the postman delivered me the Martelec box of tricks, up went the QLY and hey presto, noise free APT From Meteosat.

I am very impressed with this software and would recommend this type of approach to fellow members who do not want to open up their machines or for those who have laptops or notebooks

Geoff Brown, GJ4ICD,
Chairman UKSMG TV Shop, Belmont Rd, St. Helier, Jersey

Dear James,

May I through the columns of your now excellent journal thank everyone concerned who helped me iron out my problems after taking delivery of my PROsat 11 from RIG in January. Up until then I had been using Amigasat and the Dartcom scanning receiver with no real problems. In fact Amigasat is an excellent piece of software and good results were achieved from the polar orbiters. Admittedly the system had not been used since late Autumn, the Amiga being sold to make way for a 40Mhz 386DX in kit form.

On installing PROsat 11 on my newly built PC I was most disappointed to find that on overhead passes the video level was varying badly from about Paris up to central Norway causing light and dark bands just like when you alter the audio level from a taped image. Never having seen this before my first assumption was that PROsat was to blame. Dave Cawley looked at some zipped disks of the images and suggested that it was the aerial or receiver at fault.

A new aerial was bought from RIG (excellent value) with no difference to the results. The pre-amp was removed and various changes (including by-passing the power supply with a 12 volt motorcycle battery) brought no improvement to the images.I then borrowed a Dartcom receiver from a friend. This was an exact clone of mine. The results were perfect. Dave Cawley was correct! It was the receiver.

A quick- call to Dartcom and the module was on its way to Devon to be checked out. The lads down there took the trouble to phone me at work and discuss the problem. It seems that the module was 2k off frequency and with strong Doppler on overhead passes the PLL was not coping. For good measure they changed the IF Amplifier and some of the filters. The bill for all this? The princely sum of £13.60 including carriage. The module was safely back in my hands in just over a week and before Dartcom received my cheque for the repair! That's what I call service.

The receiver now works perfectly. Descending NOAA passes are now almost noise free down to Marrakech and Met 3/4 well past the Canaries. Before they would run out of steam about Gibraltar. I had one Met 3/4 pass on Feb. 27th that took in the St. Lawrence river almost west to Quebec! Watching images has now become a pleasure again.

Best wishes,
James Laurence Patton, 48 Isla Road, Luncarty, Perth PHI 3HN

Dear James,

62 CM AND GO

After many years of polar satellites reception, I started to build my Meteosat sdus. I have two problem for Meteosat receiving:
- a no-dish roof
- no south facing walls available.

In late 1992 I obtained a little corner in a south facing terrace but because of lack of space "No big dish!" the neighbour says. (note that a big dish is a 1.2m dish!!). The solution? a challenge with MET4. Why challenge? Because I am attempting Meteosat reception with a very small dish.

First: I purchase a used 2ft offset TV dish from a friend. Second: screw a 1.7 Ghz feed at the focus of the "toy". At the RF stage I used the Martelec Downconverter. Having put all together (all cables are CT100 fitted with "N" and "F" connectors) and set azimuth and elevation, I switch on my scanning receiver. SURPRISE!! The toy work, but the signal is weak and very noisy.

The challenge is lost? I think : Dish size ? Feed ? Cable loss ?. I spend one hour in tests and I find the problem. The focus for a TV LNB is not the same as for a Meteosat feed. After many trimming (and coffees), I screwed the feed 12 cm closer to the dish and a strong, clean 'cloppy cloppy' comes through. I switch on my PC and wait for an APT transmission. Very, Very good, like standard 1.2m dish installation. I try with another test: unplug the downconverter and connect a RIG Hemt Lna and an IF-modified AOR 3000 scanning receiver. Tune to 1691 and 1694.5 and the same good signal appear, with only a little noise (maybe from the AF stages of receiver).

I reinstall the downconverter and all works good. Sorry MET, I'm the winner!! I set my PROSAT II for a D2 animation (followed by a C03) and later I can see a good film!. In mid-March I've followed the weather evolution on the US east coast during the snow storm (courtesy of MET3 on ch 2). This is a good idea for members with no room for a regular dish or a loop yagi.

Now a new challenge is coming. Thanks to Timestep and RIG in late 1992 I have purchased an HRPT system and now I will use my dish for polars! (with an az-el mover). Am I crazy ? Maybe, yes, but if I can I will explore all corners of weather sats with non-standard aerials or equipment.

Paolo Cerretti, Via Mazzini, 70 I-23100 SONDRIO, ITALY.

Dear James, Dear Henry, Dear friends,

I have been a RIG member for one year now, and I have the following problem:

On board my ship, if I am sailing from the Bay of Biscay to the West Indies I have no problem in acquiring polar orbiters the whole time. However on a trip from Cape Town to Buenos Aires, it takes nearly twelve hours to get a new satellite from the satellites.

Now to the main point: I would like to have access to METEOSAT, because all the time you get an updated accurate view of the weather situation. Therefore I need an antenna that points all the time at METEOSAT, in other words it must be a tracking antenna.

On land it is easy, but on ship it will be a little complicated, because the antenna must track METEOSAT and must also compensate for the movements of the ship i.e. pitch, and roll which are quick movements. Another important consideration is the exposure of such a unit to seawater spray, harsh weather conditions, temperatures etc.

By the way METEOSAT is not only transmitting pictures , but also Meteorological data. Does anyone know of a software programme to receive this data?

If there is someone who has some solutions to these problems please write to RIG, or direct to myself.

Dieter Bassek, Lindenallee 8, 2300 Kiel / 17, Germany

Dear Henry,

How to receive PDUS with a 1.2m dish: After testing with a borrowed 3.1m dish I tried PDUS also on my 1.2m dish at home. Only some lines were written.

I optimized the following: I disconnected the 12 V supply from the TimeStep datacard to the Timestep receiver after reading the last RIG journal. Supply the receiver with a good stabilized 12.5 to 13 V DC power supply, only then the pre-amp runs on 12 Volts.

A ring made of galvanized mesh was mounted at the rim of my 1.2 m Prime Focus dish, the ring is 0.5 m high and prevents signals coming from behind and aside of the dish to enter the feedhorn. This mesh has openings of 13 by 13 mm square and is used to build bird-cages. The dish-area seen by the satellite is unaltered.

I use the "babymilktin" feedhorn (round 125mm, 158mm deep) with a horizontally mounted probe. The probe is fed through 3 cm UT141 and couples directly into the RIG pre-amp, a cable of 30 meters sends the signal to the Timestep receiver. The probe-length is fixed at 35.5 mm (I still have to try a tuneable probe-length !). After adding the mesh ring to the dish the focal distance had to be optimized again, the feedhorn had to be placed about 6 cm further from the dish. After this I had a good picture, but only for a short while, after about 10 minutes the signal became weaker and the picture was distorted by missed lines. I discovered that this was caused by the warming up of the receiver. I took of the top cover and placed a small 12 V computer blower on top of the receiver, cooling the PCB at 6 Volts. After some thinking I found out that there is a temperature-drift in the crystal oscillator, the receiver probably has no AFC. After re-tuning the oscillator-coil the gain went up 2 dB's !

The complete system is running now for 9 days and I can say that only once in every 15 pictures sometimes an single line is missing, probably caused by spark-interference. My dish is mounted on the roof of a building-block where 32 families are living! Even with cloudy weather the signal strength is sufficient.

Conclusions:
1. The rig pre-amp performs very well
2. By adding a mesh ring you can increase the efficiency of the coffee-tin-type feedhorn. I am calculating a rectangular feedhorn now.
3. The timestep receiver needs a clean DC supply and an AFC or cooling fan.

It is a pity Timestep raised their prices so much, I think these prices are not affordable for hobby anymore.

April the 3th there is a HAM-VHF meeting in Apeldoorn and hope I can have my RIG-pre-amp measured there for noise and gain.

Good luck and how are your feedhorns working?

Arne van Belle, Rotterdam, Holland.

Dear Editor,

Automatic Down-loading of Wxsat Pictures...

Following my article last year in which I outline the method I was using to automatically record weather pictures it became apparent that using two computers was not really practical from an expense point of view. I therefore set about investigating how to control the Rx and Prosat II from the same computer. Having found that Prosat II would not run with Windows the only alternative was to write a TSR. Having read all the programming books this was no easy task. From initial experiments with Prosat II it appeared that it would co-habit with a well behave TSR. My friend and fellow Wxsat enthusiast Dave Rodgers was also keen for the system to work with both the Rig Rx and the Proscan Rx. The task was now clear.

In order to keep the size of the TSR to a minimum it was decided to write two separate programmes. One for the Rig Rx and one for the Proscan. After the initial stages of getting the TSR to work the programming went smoothly and around Christmas the first version for the RIG Rx was working. Shortly after Christmas Dave Rodgers started using the Proscan version. Dave runs a 286 AT machine running at 12 Mhz and to my surprise the system work well from the first attempt. This was the basic programme and the next few weeks were taken up with writing the menus and documentation. Version 1.1 of the two programmes has been running for several weeks on both my system and Dave's system with no problems. I regularly save all the visible passes which amounts to approximately 30 pictures a day.

Now to the features of Autodown and Prodown. Autodown is for the Rig Rx and Prodown is for the Proscan Rx. Basically these two programmes monitor the Rx's and set up Prosat II to the correct receive mode depending on time of day and frequency. For example if the Rx squelch opens on 137.5 Mhz Prosat II is set up to receive a NOAA picture. If it opens on 137.3MHz at night it is set to Meteor and Async mode. If it opens during the day it will set up Meteor Sync mode. The majority of the settings are selectable. All Rx operation is logged in a file for future reference. Also pictures are only saved if the squelch is open for more than 3 minutes.Each picture is stored with a unique file name.

A simple interface board is required between the Rx and the computer.This I/F connects the Rx to the computer printer port. The interface is not ideal for the RIG Rx but it works. One of the future enhancements will be a more robust interface.

This system basically means that on one computer running Prosat II and using either the RIG Rx or the Proscan Rx all the daily passes can be recorded and viewed within a few minutes. The only problem is that you need a decent hard disk. I regularly leave the system running over a couple of days and find I have 60+ pictures to view. I run Stacker and have approximately 170 Megs of Disc space. If I am going to be away for more than a few days then I tend to only store the Meteor passes.

I have uploaded both programmes with documentation on running the programme and the Interface to the RIG BBS. So hopefully copies of both programmes can be distributed this way. *[Also available on Disk 99A]*

Correspondence to:
V.P.Williams, 11 Priory Green, Highworth, Swindon, Wilts, SN6 7NU

Dear James,

Joining CO2 and CO3 Images...

I have always found it frustrating that the two highest resolution images disseminated from Meteosat divide the UK down the meridian. This must be even more annoying for people who live closer to the meridian so are always on the edge of the pictures.

I was very pleased when investigating the image processing software IMDISP which I obtained from RIG at Pickets Lock. There exists a facility in this software for superimposing images so with suitable trimming of edges this can be used to position and splice together CO2 and CO3 images. Provided the CO2 and CO3 frames are recorded consecutively the join is quite impossible to detect, in fact it does not exist as the CO2 and CO3 frames are just subsets of the whole earth image taken by Meteosat.

How to splice the images...

Obtain a copy of IMDISP from RIG. The program is on the bulletin board. As a very last resort send me a disk and return postage and I will send you a copy. There is a document file with the program, serious users should read this. Make a directory called SPLICE and put the program IMDISP in that directory. Record consecutive CO2 and CO3 images and put them in the SPLICE directory. Timestep images consist of 800 lines with 640 bytes per line.

IMDISP supports several graphics modes. I use VGA so type SET IMDISP=VGA <Return>.
This sets the correct graphics mode for subsequent displays.
Now enter the following commands:-
IMDISP <Return>
FILE CO3.DAT <Return>
800 <Return>, 640 <Return>, 8 <Return>, 0 <Return>
DIS SS 24 <Return>
DIS DOWN 100 <Return>
SAVE CO33.DAT <Return>
FILE CO2.DAT <Return>
800 <Return>, 640 <Return>, 8 <Return>, 0 <Return>
DIS SS 250 <Return>
DIS DOWN 100 <Return>
FILE CO33.DAT <Return>
DIS DSS 344 <Return>
I'm sure you will want to save your work so:- SAVE SPLICE.NEW <Return>.

Notes. A batch file should handle the whole operation. Once displayed the spliced image can be zoomed and processed in a similar way to all IMDISP images. If you look carefully you will see that the range of brightness levels displayed by IMDISP does not quite match the original image. I am working on a routine to eliminate this tiny shortcoming by splicing the raw data files rather than letting IMDISP do the processing. I hope there will be details in another RIG issue. If you are not using Timestep's 800x640 images you will have to tell IMDISP the dimensions of your image. Other Meteosat images can be spliced in the same way. Try splicing C8 and C9 pictures; an excellent image of S. Africa is quite possible. I could give you the SS and DSS values to enter but that might spoil you creative enjoyment.

Frank Bell, G7CND QTHR

HELP REQUIRED...

We have had a plea for help from a school teacher who is trying to start up what could be the first Amateur Weather Satellite Receiving Station in Chile. Although they have some basic receiving equipment, they have little in the way of computer hardware/software, and nothing for Meteosat reception at present. If there are any members who would like to help them by supplying unwanted equipment or give advice please contact: Washington Fernandez, Jose Joaquin Prieto 147, Chillan/Chile.

BULLETIN BOARDS:

There are now operating, 24 hours a day, three Bulletin Boards that you can use to download Keplers and get other information regarding latest developments in the Weather Sat scene; such as which Russian satellites are currently operating, etc. The RIG BBS also has Shareware, etc. which can be downloaded. You can also leave messages on both the RIG BBS and the Timestep BBS for the operators. There is no charge for these services, just the cost of your telephone call. The Keplers files on the RIG an Timestep BBSs are updated every week and are in Amsat and 2-line format; or give the Dartcom BBS a try.

The RIG BBS is on 0945 85666.

The Timestep BBS is on 0440 820002.

The Dartcom BBS is on 0822 88249.

The protocol is the normal standard, 8 bit, no parity, 1 stop bit.

A quarterly publication for hardware, software and applications of WEFAX, APT, VAS, HRPT and GOESTAP.

WeatherSat Ink

The Environmental
Satellite Applications Journal

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$15 US per year $20 all others, US funds
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RIG AT RALLIES

For those members who are not Radio Amateurs, a brief explanation of the term "Rally". These are events normally organised by local Radio Amateur clubs and societies, and are held in Schools, Halls, or just outside town in Marquees in local fields. There is normally parking space provided and a small entrance fee is charged. They consist of trestle tables containing new and used equipment and components, from traders in the electronics and computer field, often at knock down prices. (Many resemble the familiar Car Boot Sale.)

There are also displays and demonstrations by radio related societies and organisations (such as RIG). They normally start at 10.00 or 10.30am and fizzle out at around 4.00pm. They are normally signposted from the town in question by small signs attached to roadsigns, etc. reading "Radio Rally", "Rally", or the initials of the society, such as "ERAS", etc.

If all else fails, look for a stream of cars sprouting aerials on their roofs, and follow them. Below is a list of Rallies that we hope to attend this year; and we will be pleased to see you.

IMPORTANT... If you visit a Rally in order to purchase RIG goods please give Henry a ring a couple of days before, so that he can put them on one side for you, as only small quantities are normally taken.

June 6	Springfields, Spalding, Lincolnshire.
June 13	Elvaston Castle, Derbyshire.
June 27	Longleat, in grounds of Wildlife park.
July 4	York, Racecourse
August 18	Woburn Abbey, Bedfordshire, in the grounds.
September 12	Lincoln, Showground
September 12	BARTG, Sandown Racecourse, Esher, Surrey
September 19	Peterborough, East of England Showground
October 29/30	Leicester, in the Granby Halls (2 days)

We are always pleased to see volunteer members at these rallies, especially those who live local to the event, who can help out on the RIG stand for a short while, and give the regulars a break during the day.

RIG HELPLINES

General Enquiries Meteosat information NOAA information Supplier Complaints A copy of the Group Rules can also be obtained from John Tellick	John Tellick	081 390 3315
Russian, Chinese satellite information/status	Peter Wakelin	0344 23200
Schools Education Co-ordinator	John Tellick	081 390 3315
Schools/	John Murray	Torquay 0803 217754
Educational Enquiries	Frank Bell	Godalming 0483 416897
	Tom Walter	Reading 0734 871330
	Bob Coombes	Haslemere 0428 642930
	John Din	Bristol 0454 773387
	Alan Wright	Norwich 0603 713449
Framestore Technical Support	Mike Coombs (7.30pm-9.30pm)	0530 243494

RIG MICRO SPECIALISTS:

PC and Printer Problems	Mark Pepper (office hours)	0494 471111 (Ext.2133)
BBC Micro	Enquire via John Tellick	081 390 3315
Commodore Amiga	Chris Pretty	0420 82752
Archimedes	Tom Walter	0734 871330
HRPT	Peter Wakelin	0344 23200
PDUS	James Brown (Not available on Sundays)	0656 782632

NOTE: We are very grateful to the above members for offering their services to the Helpline. Please do not abuse the service by ringing them for queries other than those listed against their names.

REMOTE IMAGING GROUP

RIG SUBSCRIPTION - NEW MEMBER

If you would like to become a member and receive the Journal, photocopy this page, complete the form below, sign the declaration and send it to...

RIG SUB, PO BOX 142, Rickmansworth, Herts, WD3 4RQ, ENGLAND

The subscription rates for 1993 are...

UK membership	£ 9.00
Europe EC	£10.00
Europe outside EC	£10.00
Outside Europe	£12.00

Name ..... Call Sign (if any) .....

Address .....

.....

..... Post Code .....

Country ..... Telephone No. .....

Are you receiving:
Polar Orbiting Weather Satellites ..... Geostationary Weather Satellites .....

Do you require Back issues? (see Rig Shop Corner) .....

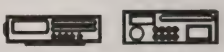
Amount Enclosed £.....

Are you willing to have your name/address made known to members in your area? YES / NO. *(Delete as applicable)*

DECLARATION: I do NOT object to the Remote Imaging Group holding my Membership details on a computer.

Signed ..... Date .....

RIG SHOP CORNER



*** ALL PRODUCTS FOR SALE TO RIG MEMBERS ONLY ***
*** FOR THEIR OWN PERSONAL USE ***
*** NOT FOR SELLING-ON ***

All prices shown include post and packing except where marked

Receiving Equipment	UK/EC Price	Overseas Price
RIG DARTCOM Meteosat Downconverter. Assembled and tested module in tin plate box	£148.00	£126.00
Complete, assembled and mounted in weather-proof box.	£185.00	£158.00
RIG DARTCOM VHF Scanning Receiver. Assembled and tested module, with LED channel number display.	£130.00	£110.00
As above, but with LCD frequency read-out instead of LED channel number display. *Both the above items are modules and require a box, together with several components, switches, etc.*	£171.00	£145.00
RIG TIMESTEP PROscan Receiver. *See main advertisement.*	£191.00	£163.00 *Special Rally Price £185.00*
RIG VHF Preamp. Includes a bandpass filter and is ideal for mast-head mounting. Assembled/tested module; needs boxing.	£17.00	£15.00
RIG TIMESTEP VHF Preamp Built and tested, in diecast box, 12vdc coax-fed	£24.00	£20.00
RIG 1695MHz Low Noise Amplifier kit. *Experienced constructors only.*	£29.00	£25.00
Computer Software/Hardware		
RIG MICROWAVE MODULES PCwSAT III, IBM/PC Compatible System. *See main advertisement.*	£ 54.00	£ 45.00 *Special Rally Price £ 49.95*
RIG TIMESTEP PROsat II, IBM/PC Compatible System. *See main advertisement.*	£124.00	£105.00 *Special Rally Price £120.00*
Antenna systems		
RIG CROSSED DIPOLES A Turnstile type design, in kit form *(available in UK only)* incl. P&P		£26.00 *Special Rally Price £20.00*

DISHES *(Available in UK only - Prices do NOT include P&P, see below)*

1.0 Metre (dish only), nearly new condition	£25.00
1.2 Metre (dish only), used condition	£25.00

Dish Feeds - Enquire availability from the Chairman.

The above dish prices are for collection from the Chairman, or by prior arrangement at Rallies or Exhibitions.

RIG Binders

Available by post from Gordon Fleming, 168 Bythway, Welwyn Garden City, Herts. AL8 1DU. UK Price £4.00 each, EC/European Price £4.50, Outside Europe Price £5.00. Cheques to *"REMOTE IMAGING GROUP"* please.

Back Issues of RIG Newsletters

		Rally Price	UK Price	EC/Europe Price	Outside Europe Price
RIG 8-11	1987	£4.00	£5.00	£6.00	£7.00
RIG 12-15	1988	£4.00	£5.00	£6.00	£7.00
RIG 16-19	1989	£4.00	£5.00	£6.00	£7.00
RIG 20-23	1990	£5.00	£6.00	£7.00	£8.00
RIG 24-27	1991	£5.00	£6.00	£7.00	£8.00
RIG 28-31	1992	£5.00	£6.00	£7.00	£8.00

Note: Prices quoted are for a set of four, including Post and Packing.

RIG 1-7 are currently out of print. Individual issues are no longer available (hardship cases excepted).

Ordering Information

All items are available from the Chairman, Henry Neale (except where marked) and include return by UK 1st class mail (except dishes and Newsletters). Euro overseas sent via Airmail printed paper rate.

UK VAT is now applicable on sales to the following EC countries - France, Germany, Belgium, Portugal, Spain, Republic of Ireland, Denmark, Italy, Luxembourg, Netherlands, United Kingdom (including Isle of Man). Members in these countries should use UK/EC price when ordering. EC members who are registered for VAT must forward their VAT registration No. to the Treasurer to enable them to receive VAT exempt goods.

As UK/EC prices now include VAT where applicable; receipts will be issued upon request. Remote Imaging Group VAT Registration No. 594 7483 83.
Channel Isles: divide by 1.175 to remove VAT content.

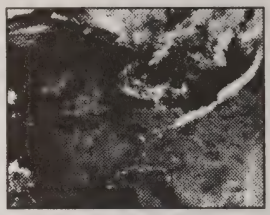
UK members, By Cheque or Postal Order. **Overseas members,** Pay by Bank Draft (drawn on a UK London-based bank) or Eurocheque(s). (Payments to a Maximum of £100.00 in any one Eurocheque). No local currency please.
All cheques made payable to *"REMOTE IMAGING GROUP".*

* * * \

TH2 IMAGING

34 PRINCES GARDENS
MARGATE
KENT CT9 3AR

Tel : 0843 - 223831
Tel : 0843 - 596256



TH2SAT PC Weather Satellite Decoder Version 2.0 - £100 + £5 P&P

TH2SAT is a software and hardware package that will allow the display of APT signals on an IBM Personal Computer (or compatible). The PC half card contains a single phono input socket, decodes APT signals to 256 levels (using an 8-bit A/D converter) and samples at 4800Hz. In 1024x768 pixel video mode, each pixel is a discrete sampled value, i.e. no scaling up from a lower resolution - ideal for zooming. The input signal level is controlled directly from the keyboard (no knobs to set up or adjust). TH2SAT supports VGA or Super VGA graphics (most Super VGA colour cards are supported - TH2 Imaging strongly recommend Super VGA).

- 3 Video modes supported 320x200 640x480 1024x768 - all modes 256 colours
- Synchronises to METEOSAT (including start tone), NOAA and METEOR
- Aspect ratio correction selected from keyboard
- Zoom images to any level of magnification
- Colour images with dynamic range control and multiple palettes with specific infra-red palettes
- Built-in signal level controller from keyboard - no hardware set up
- Independent signal level control for each satellite mode, e.g. infra red and visible light
- Built-in software brightness controller from keyboard
- Picture show facility (up to 255 image files)
- 3-dimensional projection with two linearity modes and three intensities
- High-pass (three intensities), low-pass and median filtering
- Instantaneous contrast equalisation enhancement and contrast stretching
- Histogram frequency graph, image negation and inversion
- Unattended operation of up to 99 passes or METEOSAT frames
- Unattended operation time plans can be saved and reused, e.g. METEOSAT C02
- Saves pictures in compressed format (average 30% saving)
- Simple menu-driven system - no mouse required
- TH2SAT is a single, self-contained program - all features work with all satellite images
- PCX image translator program included
- Monochrome and Colour animation with selectable image zooming and choice of palettes
- Extended memory support for animation (greater than 10 frames/second on a 386sx 16Mhz)

TH2SAT Demonstration Disc - £3.50 including P&P

A demonstration disc with sample pictures containing the full TH2SAT system (excluding image reception capability) - not just a picture show. When ordering, please state disc size (3½" or 5¼"), disc density and video card (VGA or ½ / 1 Megabyte Super VGA).

METEOSAT Loop Yagis - from £55 + £6 P&P or £12 Courier Delivery

TH2 Imaging supply 37 element loop Yagis (complete with "N" type connector) for METEOSAT reception. They are provided as an easy-to-assemble kit. Yagis with more than 37 elements are available on request.

TH2 Imaging operates on the basis of the price you see is the price you pay. There are no **hidden extras** or **additional charges**. These prices apply to RIG members only. Postage rates apply to UK.

PROLOGUE COMPUTERS LTD

2 ORCHARD RISE, OLVESTON, BRISTOL BS12 3DY
TEL. 0454 612882 FAX 0454 618885

□ COMPUTERS

Professional quality Computers at discount prices. Ideally suited for use with Weather satellite systems, at display resolutions up to 1024 x 768 Pixels With Super VGA monitor.

386sx 33MHz. 16Kb Cache, 2Mb RAM (expandable to 16Mb) Sony 1.44Mb Floppy drive.
Small footprint high quality metal case, 200W PSU. 4 Free Expansion slots.
14" SVGA Colour monitor (0.28 d.p.), T.L. ET4000 1Mb (1024x768x256) VGA Card.
40Mb 18ms Hard Disk, AMI Bios, Mouse. £660.00

486SX-25MHz. 4Mb RAM (expandable to 32Mb). Sony 1.44Mb drive.
Small footprint high quality metal case, 200W PSU. 4 Free expansion slots.
14" SVGA Colour monitor (0.28 d.p.), T.L. ET4000 1Mb (1024x768x256) VGA Card.
40Mb 18ms Hard Disk, AMI Bios, Mouse. £810.00

486DX-33MHz 64Kb Cache, 4Mb RAM (expandable to 32Mb). Sony 1.44Mb drive.
Small footprint or full AT case, 200W PSU. 4/5 Free expansion slots.
14" SVGA colour monitor (0.28 d.p.), T.L. ET4000 1Mb (1024x768x256) VGA Card.
40Mb 18ms Hard Disk, AMI Bios, Mouse. £940.00

□ OPTIONS:

14" Super VGA Monitor (Low Rad. N.I) .....ADD £62
Memory Upgrade per Mb.....ADD £27.75
Genoa 7900 ET4000 1Mb VGA Card .....ADD £49
Mini Tower Case (Leaves 5 free expansion slots) ADD £10
102Mb 15ms Hard Disk..... ADD £70
125Mb 15ms Hard Disk.....ADD £90
MS DOS v6.0.....ADD £49

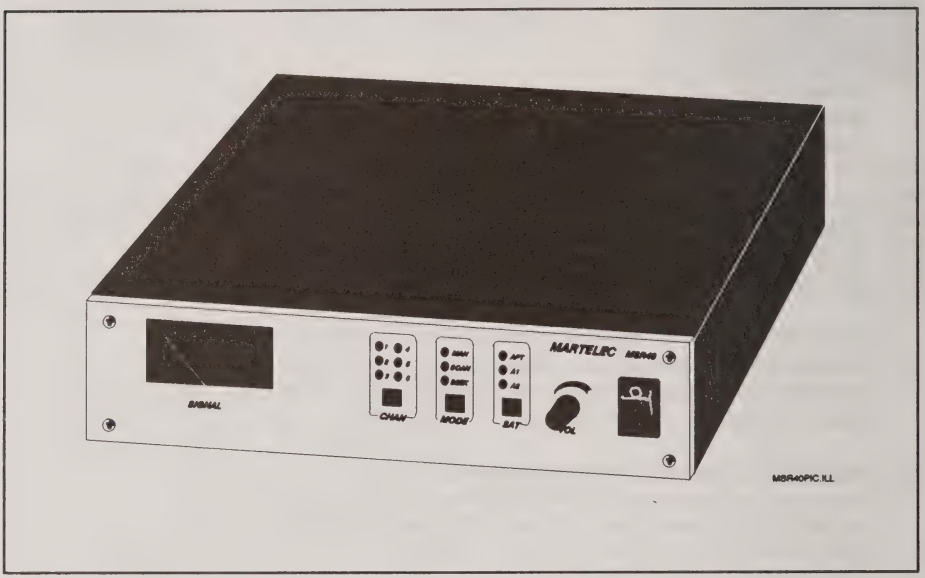
□ COMPONENTS:

MOTHERBOARDS : 386SX-33 /16Kb £117, 486SX-25 £229, 486DX-33 /64Kb £379.
VGA CARDS : Genoa 7900 ET4000 24bit 1Mb (1024x768x256 colours) £129
Trident 1Mb (1024x768x256 colours) £53.75
T.L. ET4000 1Mb (1024x768x256 colours) £79
MONITORS : 14" VGA Mono £79, 14" VGA colour £185
14" Super VGA (0.28mm) £209, 14" SVGA (0.28mm NI LR) Colour £268
FLOPPY DRIVES : SONY 1.44Mb £32, 1.2Mb £39.50
HARD DISKS : SEAGATE 40Mb £99, 102Mb 15ms £169, 125Mb 15ms £189.

Please call for latest pricing on systems and components (Day/Evening)
All prices EXCLUDE VAT & Carriage. Delivery 5 to 10 Days

MSR40 Synthesized Satellite Receiver

.....When quality counts



The result of 12 month's intensive R & D, and rigorous testing, the all new MSR40 is a truly outstanding performer. Designed in accordance with the principles set out in Roger Belcher's authoritative article (RIG27), and fully conforming with his specifications for the highest possible level of interference rejection, this receiver is the measure by which others will be judged.

Housed in a custom-designed aluminium enclosure, the MSR40 is both attractive and rugged. Inside, its rigorously designed and tested circuitry ensures that you have the highest performance currently available. If you would like to know more about the MSR40, please call or write.

Features:

- *Extremely high interference rejection capability (Rejection of > + 13dBm at 200KHz offset)*
- *Fully synthesized*
- *Attractive, compact design*
- *Remote control facility*
- *Mains or DC power*
- *Separate inputs for Meteosat and VHF inputs*
- *Meteosat downconverter power via coax feed*
- *Signal level meter*
- *Intelligent Search and Scan modes*
- *Signal Level Output on rear panel*
- *Constant output level when switching APT/WEFAX*

The MSR40 is sold on a money-back guarantee basis.

Price £295
(excl. VAT & carriage)

martelec *communication systems*

The Acorns, Wyck Lane, East Worldham, Alton, Hampshire, GU34 3AW, U.K. Tel/Fax 0420 82752

AMIGASAT 3.0 Decode Package

A Powerful Weather Satellite Processing Package for the Commodore Amiga Computer Range

Amigasat has long been renowned for its excellent DSP and image processing power. The new version 3.0 builds on that reputation to provide a first class package providing numerous image processing techniques which are both powerful and easy to use.

The Amiga range of computers was originally designed as a video processing platform, and so it is no surprise that it excels in this department. Commodore have launched three advanced new machines (1200, 2400, 4000) having the new AGA graphics chip set, to provide superb high resolution graphics. Because the Amiga is a multitasking machine, Commodore are now releasing them with AREXX, a powerful programming language which enables the new version of Amigasat to be readily configured in every aspect for a particular task - easily!

Most decode packages have some feature or other to separate them from the rest - of the many packages that we have seen, Amigasat stands in a class of its own as the best all round performer.

Check out some of its many features...

- *Automatic image capture using Meteosat or GMS digital headers*
- *Stored resolution to 2048 x 2048 x 256! (e.g. full 17min polar pass)*
- *Extremely powerful, yet simple to use software*
- *Direct input of other IFF or GIF files (such as RIG GIF library) for image processing*
- *Has AREXX, allowing powerful customization of Amigasat application*
- *Most advanced digital signal processing techniques used for out-standing image quality*
- *Animation, with or without hard disc*
- *Runs in Amiga's own multi-tasking environment*
- *Multiple on-screen images*
- *Mathematical mixing of multiple images*
- *Registered users receive free newsletter and low-cost upgrades*

If you would like to receive our information pack on the Amigasat, or any of our other products, please call or write to the address below. Demonstration disks are available price £5 inclusive.

martelec *communication systems*

The Acorns, Wyck Lane, East Worldham, Alton, Hants, U.K. GU34 3AW Tel./Fax (44) 0420 82752

RIG - MICROWAVE MODULES PCwSAT III

A low cost Weather Satellite System from Microwave Modules; fully compatible with RIG PCsat III. Handles all known APT satellites, including NOAAs and Soviets, as well as Meteosat, and supports all known VGA video cards in all modes. Automatically animates up to 100 frames on Meteosat. The computer requirements are an XT (minimum); a 286 or above is better. We recommend a hard drive. MS DOS is also recommended, and all features are available on a 640kb memory machine. A colour monitor with VGA capabilities is also desirable.

RIG - TIMESTEP PROsat II

This system does all that PCwSAT III does, and a lot more, including image processing, 3D, NOAA gridding, NOAA temperature calibration, and full data from NOAA and the Soviet series in a huge 3 Mb file. Reception can be in any VGA mode. It also contains a built-in Laser printer dump with all 32 steps being visible on the Meteosat Test Card. Histogram Equalisation is included to quickly contrast stretch dark or light images. Median filter removes country outlines from the Meteosat images for 3D projection and removes spot noise from noisy images. The Gridding overlays the NOAA image with Latitude and Longitude lines, and will indicate Latitude, Longitude and Temperature (when in IR mode), simultaneously on any point of the screen.

RIG-TIMESTEP PROscan POLAR RECEIVER

A professionally made scanning receiver covering all NOAA and Soviet Polar Orbiting Satellites. The frequency can be readily seen via an LED on the front panel and unwanted satellite channels can be locked out. It is designed with a lot of internal filtering, making it ideal for locations that suffer from Pager problems. It is resistant to pager interference at 1 to 2 miles (where the field strength is at maximum), and also carries an unconditional money back guarantee.

For the latest prices of the above equipment see Rig Shop Corner

Spacecraft Image Processing . . .

NOAA APT 24 bit IR/Vis false colour composite from The Weather Desk processed in PDSview

The Weather Desk
PDSview

Acorn

For all RISC OS 32 Bit Machines with 2MB or more and Hard Disc

Compatible with all Graphics Cards

spacetech
space science resources

21 West Wools, Portland, Dorset DT5 2EA. U.K. ☎ 0305 822753 Fax. 0305 860483

Timestep

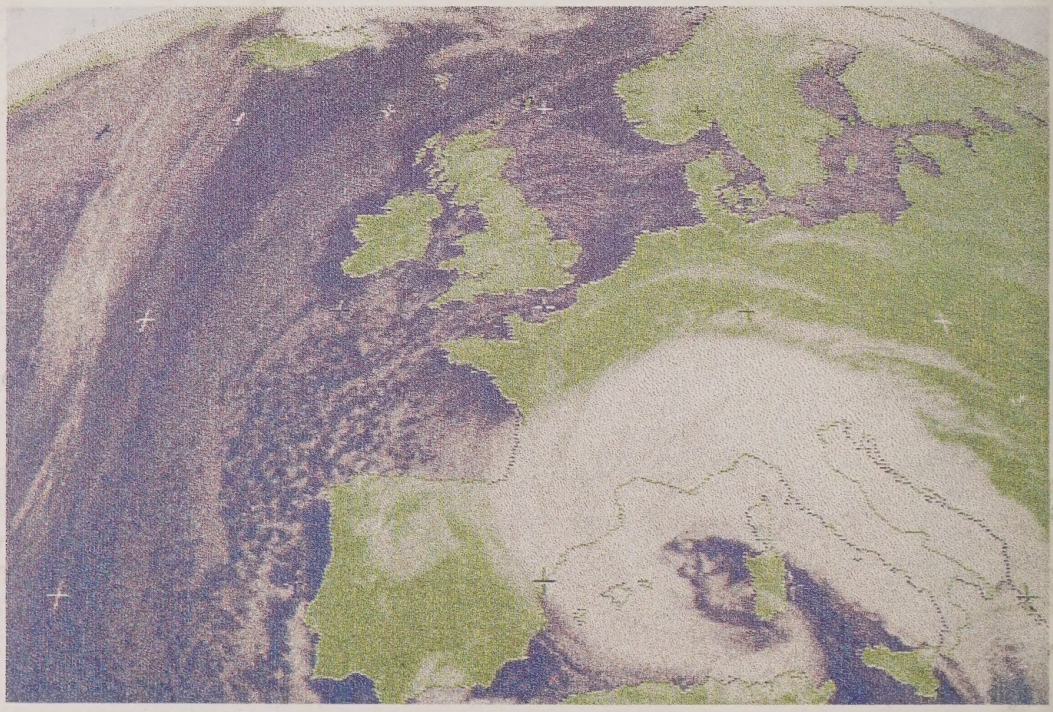
Timestep are now manufacturing and retailing complete systems for SDUS, PDUS, APT and HRPT (NOAA and Meteosat, low and high resolution). You can purchase completely ready to go systems including the computer. Or you can purchase each part separately. We really do stock all the little parts from ready made connecting cables to 24 bit video cards. Please enquire if you need anything.

Visitors to the Dayton Hamvention this year, will know that the majority of the slides used in the various presentations, were from the Timestep 10 bit HRPT system.
Even users of competitors hardware were using the new Timestep 10 bit HRPT software.

Multi Spectral View II has to be the ultimate Weather Satellite image processor. Combining infrared and visible images in stunning full 24 bit colour produces spectacular results ! The program will take a variety of image formats including the new SPOT CD ROM, the Voyager Planetary Data CD ROM's, 3 band HRPT and even NOAA APT.
Full 24 bit video cards are now under £100.00.

Ordering weather satellite equipment has never been easier, everything you need for any type of weather satellite is available for shipping anywhere in the World, just quote your Visa or MasterCard number (Access, Barclaycard etc).

The image below has been taken straight from the new HP550C budget colour printer from the new full colour Meteosat Animation. Animating up to 1,000 full screen, full colour images is simple, just run the program and walk away, each new full colour image is automatically received and added to the animation sequence, no fiddling with the keyboard or mouse is necessary !



Timestep PO Box 2001 Newmarket CB8 8XB England
Tel. 0440 820040 Fax. 0440 820281